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ABSTRACT

The U.S. Department of Education awarded 19 Challenge Grants for Technology in Education in fiscal year 1995, and planned to award additional grants in fiscal year 1996. The diverse projects are intended to mobilize resources, develop technology enabled learning environments, and provide lessons to others seeking to make effective use of technology in education. Each grantee is required to carry out a project evaluation. This sourcebook provides guidance and materials to support the development and implementation of evaluations by the project managers and evaluators of the Challenge Grants. The sourcebook will be used in workshops for project leaders to discuss the projects and program evaluations, and by project leaders to perform their evaluations. The sourcebook is intended to be suggestive and helpful rather than prescriptive. The sourcebook also provides background materials for national meetings of the project leaders and evaluators to help further develop a collaborative relationship among project leaders, evaluators, and the Challenge Grant Program Office. Evaluation serves three distinct purposes by providing: (1) regular, structured, and objective feedback to project leaders and other participants; (2) documentation of project outcomes and lessons learned; and (3) accountability to funders and key stakeholders. Topics covered include: evaluation design issues, progress assessment, and how to use the sourcebook materials. Appendices comprising the majority of the document include formats and templates for creating a progress assessment portfolio; an annotated bibliography; list of contacts; sample of planning and data collection instruments; a list of data collection instruments; and an example reform portfolio. (Author/SWC)

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A Sourcebook for Evaluation of the Challenge Grants for Technology in Education

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PREFACE

The U.S. Department of Education, through its program of Challenge Grants for Technology in Education, funded nineteen consortium projects in fiscal year 1995 to encourage improved student outcomes through the use of educational technologies. It will fund additional projects in fiscal year 1996. As stated in the guidelines for Challenge Grant applications, projects "should be prepared to conduct careful evaluations of educational effectiveness at every stage of the effort."

This document presents a sourcebook on evaluation to aid the Challenge Grant recipients in the design and implementation of their evaluations. It is the second update of the draft sourcebook that initially was presented to the original nineteen grantees and the federal Interagency Learning Technology Office in March 1996. We expect that this document will remain a draft—a living document that gets updated periodically s the projects unfold. It will be used in workshops for Challenge Grant project leaders to discuss the projects and program evaluations, and by project leaders to perform their evaluations.

The sourcebook has been prepared by the RAND Critical Technologies Institute (CTI), based in part on prior CTI and RAND work on federal educational technology strategy and evaluation for the Office of Science and Technology Policy and the Committee on Education and Training of the National Science and Technology Council. CTI was created in 1991 by an act of Congress. It is a federally funded research and development center (FFRDC) within RAND. CTI's mission is to

- provide analytical support to the Executive Office of the President,
- help decisionmakers understand the likely consequences of their decisions and choose among alternative policies, and
- improve understanding in both the public and private sectors of the ways in which technological efforts can better serve national objectives.

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SUMMARY

The U.S. Department of Education awarded 19 Challenge Grants for Technology in Education in fiscal year 1995. These 19 diverse projects are intended to mobilize resources, develop technology enabled learning environments, and provide lessons to others seeking to make effective use of technology in education. Additional Challenge Grant awards will be made in fiscal year 1996. Each grantee is required to carry out a project evaluation, and the Challenge Grant Program Office wants to develop a collaborative relationship among project managers, evaluators, and the Program Office itself.

The Program Office asked RAND to assist it and the project teams in framing and carrying out evaluations. This sourcebook provides guidance and materials to support the development and implementation of evaluations by the project managers and evaluators of the Challenge Grants for Technology in Education. It is intended to be suggestive and helpful rather than prescriptive. This document also provides background materials for national meetings of the project leaders and evaluators.

CONNECTING EVALUATION TO A STRATEGIC PLANNING PROCESS

Evaluation should be part of each project's strategic planning process. Because resources for evaluation are limited, RAND suggests that there be a single evaluation effort beginning during the planning of the project and integrally involved throughout its operations. The evaluation serves three distinct purposes by providing:

(1) regular, structured and objective feedback to project leaders and other participants;
(2) documentation of project outcomes and lessons learned; and
(3) accountability to funders and key stakeholders.

Each of these purposes is described in more detail below.

Regular Feedback to Project Leaders and Other Participants

The projects supported by the Challenge Grants are developmental, intended to create and demonstrate a variety of potentially effective applications of technology in education. An integral evaluation activity can provide important and timely feedback to managers and stakeholders. In particular:

- Planning the evaluation requires specifying and sharpening the goals of the project, including both outcome goals (in terms of improved student performance) and process goals (in terms of implementation milestones such as equipment installation or staff training).
- When effectively integrated, evaluation planning can also develop shared expectations among stakeholders concerning when various outcomes will be achieved, lessening possible misunderstandings during the course of the project.
- Feedback of the results of early "formative" evaluation to project leaders will provide information on accomplishments relative to plans and expectations that project leaders and the implementing staffs can use to modify and improve their development efforts.
- Later in the project, reports on student and other outcomes to project managers and implementers allow them to compare those outcomes with goals and to adjust the project design and implementation to improve outcomes.

Documentation of Project Outcomes and Lessons Learned

Documentation of outcomes and lessons serves three purposes: mobilization of a wide variety of local resources and commitments to improve education through the effective use of technology; demonstrating that such uses of technology will lead to improved student outcomes; and providing lessons about project design and implementation that other communities and Challenge Grant recipients might use to improve educational outcomes. These purposes require documenting the projects' evaluation and accomplishments in forms that potential adopters can use to achieve similar goals.

Accountability to Funders and Key Stakeholders

Reports of the evaluation, together with actions taken to deal with shortfalls in implementation and performance relative to initial goals, provide an important opportunity to engage relevant publics in the development and demonstration efforts. Through such reports, the project leadership can make itself accountable to the government and private funders; and to the school administrators, teachers, students, and parents who are implementing the project. Engagement of these groups is critical to achieving significant educational change.

KEY ISSUES EVALUATIONS MUST ADDRESS

The projects supported by the Challenge Grant program vary widely in their objectives, organization, complexity, and scope. Obviously, all involve the application of technology. However, in some projects the technology is one of many elements of a system-wide reform strategy, while in others the scope of reform is more circumscribed and technology provides a more central focus.

As a consequence, evaluators face a number of challenges in planning and accomplishing their tasks. For instance:

- The outcomes sought are usually complex and not entirely captured by traditional educational measures. For the most part, those whose proposals were awarded grants seek better learning outcomes on a complex variety of dimensions rather than improvements on traditional test scores. However, the communities that support these projects might place great value on test scores, and therefore projects that ignore test scores might lose public support.
- The causes of performance outcomes are also complex. A project incorporating technology will often also include new pedagogical strategies, new curriculum, new assessments, changed amount of time in the school day, and changed school organization. It is impossible to attribute the outcomes of individual projects uniquely to the use of technology. Consequently, evaluators must try to provide as much information as possible on the key factors that affect the success or failure of a project effort.
- The outcomes of a project will be strongly affected by the project's setting. A project's location--in a poor rural area, a depressed urban setting, or a well-off suburban community--will affect both its implementation and its effects. It is important for external consumers of evaluation information to understand the context in which a project is implemented.
- The goals of each of the Challenge Grant projects are unique. For that reason, one evaluation design will not fit all. For projects in this program, the evaluators have an unusually important responsibility to be clear concerning the goals of the projects they are evaluating and to select measures of outcomes and implementation consistent with those goals.

APPROACHES TO DOCUMENTING EVALUATION

The Challenge Grant Program Office is interested both in fostering reporting that is consistent with the goals and context of individual projects and which provides some information that can be aggregated across projects that will help the Office to describe and justify the program as a whole. RAND proposes that the documentation of the individual projects take the form of a "Progress Portfolio" which each project and evaluator would prepare. The collection of such portfolios would constitute an important part of the accountability the program has to the public. RAND believes a portfolio allows the evaluator and the project to provide information on a rich array of outcomes, to describe the project giving rise to these outcomes in adequate detail, to characterize contextual factors, and to reflect on lessons that emerge as the implementation progresses. If the portfolio is treated as a living document, subject to regular revision and updating, it can at least partially serve each of the purposes of the evaluation outlined above: feedback to management, documentation of outcomes and lessons learned, and accountability to funders and key stakeholders. This sourcebook elaborates on the form and purposes of such a portfolio and provides sample worksheets and a hypothetical example of such a portfolio.

The Program Office also intends to create a framework of indicators and descriptors that can be developed for each projet and aggregated for a variety of reporting purposes. These indicators and descriptors fall into six broad categories (which are not wholly distinct):

(1) The instrumental purpose s of the project: how is the project seeking to improve the learning of its target population.
(2) The primary objects of expenditure of project funds.
(3) A description of the population(s) served by the project.
(4) Descriptions of the leadership and organization of the development and implementation work.
(5) Enumeration of the "performance" outcomes sought.
(6) Special contextual features of the project.

1. INTRODUCTION

This introduction provides background about the Challenge Grants, describes the purpose of this sourcebook, defines some important concepts of strategic planning, and outlines the remainder of the sourcebook.

ORIGINS OF THE CHALLENGE GRANTS

As part of broader school reform efforts aimed at improving student performance and preparing students for the future work force, the federal government has promoted the use of technology in education. One means for doing so is the use of matching grants to local communities. In 1995 the U.S. Department of Education (ED) issued a Request for Proposal (RFP) inviting local consortia comprised of one or more local education agencies to apply for Challenge Grants (i.e., matching grants) to encourage the use of technology to:

- strengthen the school reform effort;
- improve student achievement; and
- provide sustained professional development.

Five hundred and thirty proposals were submitted in response to the RFP. After a rigorous review process, ED awarded nineteen grants using fiscal year 1995 funds. Subject to the availability of funds another round of grants, perhaps 23 to 24, will be awarded with fiscal year 1996 fund. Applications for this second round of grants were received in June 1996 and will be awarded by the end of the fiscal year.

A condition of each grant was the development and implementation of an evaluation plan by the local consortium or others acting on its behalf. ED intended that the evaluations yield two types of information. First, each project evaluation should measure the success of the individual project in meeting both its unique goals and the goals common among the projects. In combination, the sum of the project evaluations should measure the success of the program in meeting the common program goals. Herein, the term "project" is used to refer to any one of the individual grant recipients, while "program" refers to the total of the projects administered by ED under P.L.103-382, Title III, Section 3136.

PURPOSE OF THIS SOURCEBOOK

ED asked RAND to develop an evaluation sourcebook for the Challenge Grant project leaders. The purpose of the sourcebook is to help them construct evaluation plans to: (1) ensure that evaluations are rigorous and stand up to scrutiny; (2) increase the probability of having measurable outcomes; and, (3) encourage a set of common indicators or comparable data across projects to enable a rigorous program evaluation. This sourcebook was first presented to the original nineteen grantees and then updated for the next round of fiscal year 1996 grantees.

The primary audiences for this sourcebook are local policymakers charged with ensuring that the Challenge Grant dollars are put to good use and the local evaluators of the Challenge Grant projects. For these audiences, the purposes of the sourcebook are:

- To describe how strategic planning is the starting point for evaluation and how decision makers can use evaluation findings in their planning.
- To raise issues likely to affect evaluations of education technology projects.
- To suggest performance measures common to all projects and appropriate means of data collection.
- To describe a tool called progress assessment portfolios that the projects might use to make their evaluations useful to their different audiences.
- To provide an annotated bibliography and other reference materials.

EVALUATION AS PART OF A STRATEGIC PLANNING PROCESS

The Challenge Grant projects are in a developmental stage. They are not yet fully specified and are expected to change during their lifetime. Under these circumstances, the benefits of evaluation can be maximized only if it is used as a tool in a strategic planning process to provide useful and timely information with which to improve project outcomes.

Strategic planning should enable an organization to better achieve its goals and function well in times of uncertainty or when faced with major challenges. Strategic planning has five components: program design, implementation, evaluation, feedback, and revision (as shown in Figure 1.1). These are iterative steps that require project managers to:

- Develop a comprehensive mission statement focused on an identified need or set of needs and a set of objectives agreed to by the project's principal actors (box 1).
- Develop program interventions or activities including statements that logically relate the program objectives to program activities. (box 1).
- Create and deploy an operating plan and implementation process, including resource allocations, with benchmarks for and definitions of implementation outcomes, interim outcomes, and final outcome achievements (box 2).

- Create and deploy an evaluation process linked to project objectives and benchmarks (box 3).
- Provide feedback of evaluation results to relevant audiences (circles in Figure 1.1) for iterative cycles of program revision, scale-up, or termination, as appropriate.

Audiences for and Purposes of Challenge Project Evaluations

The Challenge Grant projects have four potential audiences and uses for evaluation information as indicated by the circles in Figure 1.1:

(A) Internal Project Leaders. Evaluation information produced on a regular basis can be used by project leaders to adjust the project over time to improve the implementation and outcomes.

(B) Community/Local Consortia Participants. Evaluation information can help consortium members increase the effectiveness of their participation. Evaluation results can be used to garner further support within the community and to attract additional funding for the project.

(C) Federal Funders. Evaluation outcomes, both interim and final, can be used by ED and the U.S. Congress to determine the extent to which the program should receive additional funding, whether and what changes should be made, and whether new projects should be added to the Challenge Grant program.

(D) Broader Education Community. Through evaluation of the activities associated with the grants, ED hopes to understand which approaches work to promote technology usage and ultimately better student outcomes, and to disseminate these findings to other local communities to improve the nation's educational system.

Thus, the requirement in the RFP for evaluation of the projects was meant as a positive step to increase the efficacy of the projects, to ensure public review of the program supported by objective evidence, and to provide information to the broader public for judging whether or not to adopt any of the project models.

Data Required for Evaluation

The data needed for sound evaluation and feedback fall into five major categories: (1) intervention or project activity data; (2) implementation data, especially variables that indicate observable levels of implementation; (3) data about performance on a set of interim outcome variables, (4) data about performance on a set of final outcome variables; and (5) data that describe important environmental or contextual factors (exogenous variables) that might affect project outcomes. Some of these data are developed during the strategic planning steps prior to evaluation.

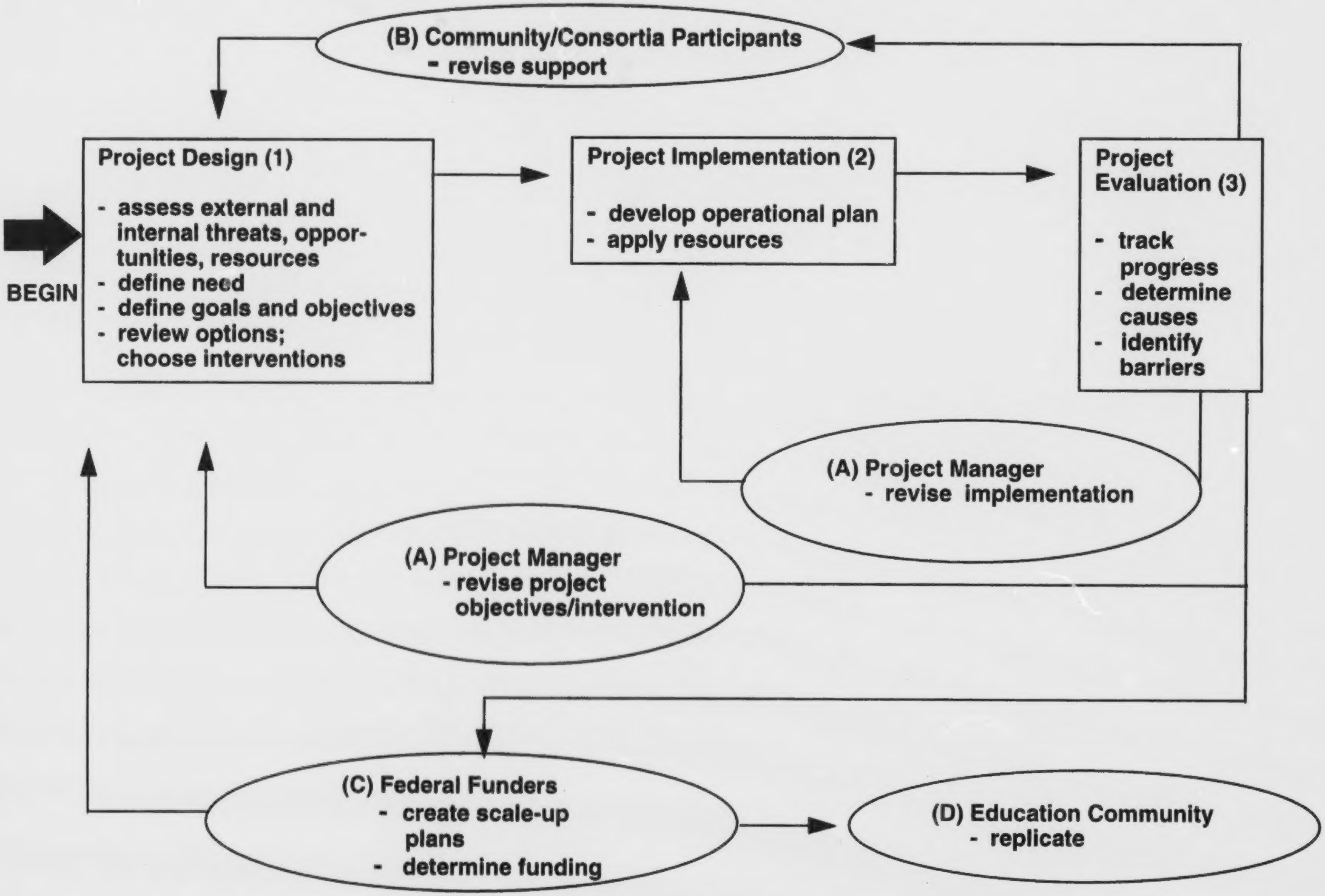

(B) Community/Consortia Participants
- revise support
Project Design (1)
- assess external and internal threats, opportunities, resources
- define need
- define goals and objectives
- review options; choose interventions
BEGIN
Project Implementation (2)
- develop operational plan
- apply resources
Project Evaluation (3)
- track progress
- determine causes
- identify barriers
(A) Project Manager
- revise implementation
(A) Project Manager
- revise project objectives/intervention
(C) Federal Funders
- create scale-up plans
- determine funding
(D) Education Community
- replicate

Figure 1.1-Integration of Strategic Planning and Project Evaluation

Identifying the goals, the objectives, and the project activities (with their logical connection to goals of the program) is the first and most important step toward a rigorous evaluation. The first category, included in the project design step of strategic planning, is the most important step toward a sound program design as well as a sound evaluation. Evaluation, to be useful, should be clearly linked to program goals, objectives, and interventions. Evaluation should provide information to the audiences listed above about whether or not the project activities enabled sites to meet the goals and objectives set out.

The following paragraphs describe briefly each of these categories of data. Further details about the categories of information, their uses, and actual examples are found in later sections and in the appendices.

- **Interventions or Project Activity Data.** This category includes: (1) project objectives such as improving math scores for disadvantaged urban children, or increasing cultural awareness for rural children; and (2) defined activities or program interventions such as the deployment of computers or software in the classroom, delivery of computers to children in their homes, the building of network capability, additional professional development for teachers, or provision of training in curriculum writing. Evaluators use these data about the proposed treatment to determine what interim and final outcomes to measure to judge whether the project activity is having the desired effect.
- **Implementation Data.** Implementation data document observable actions or products that indicate whether the project is being implemented as planned. These variables are specified in the operations or implementation plan, often with benchmarks, and included in the evaluation design as variables which will be tracked over time. They might include such indices as: number of computers actually purchased, location of computers purchased (i.e., percent in schools versus homes), number of new members in a consortium, level of matching funds raised, and number of teachers receiving training. Evaluators use this information to judge whether the program was implemented and therefore had an effect. Without measurable implementation variables, the evaluators cannot effectively relate program activities to outcomes.
- **Interim Outcome Data.** Data on observable interim effects or early outcomes indicate whether the project is heading toward the desired outcomes. These interim measures can help project managers take early action to ameliorate problems and improve project outcomes. They are typically specified as concepts in the operational

plan, perhaps with benchmarks, and further refined into measurable variables as part of the evaluation plan. They might include:

- Changes in classroom activities, in adult-to-youth interactions, and in the attitude of teachers and parents toward computer usage.
- Products such as units of curriculum, units on the network, new assessments, or sites on the World Wide Web (WWW), and how many times they were accessed.
- Short-term changes in student outcomes such as modest increases in test scores, reductions in disciplinary referrals, increases in homework assignments completed, or teachers' judgments about student outcomes.
- **Final Outcome Data.** These are measurable changes in the variables most closely associated with desired final project outcomes that are developed during project design and project implementation and fully articulated as measurable variables in the evaluation plan. They might include: (1) direct outcomes such as changes in test scores or student performances; (2) consequential or subsequent outcomes that are associated with very long-term effects of the project such as an increase in college-going rates or increase in job offers to students in the project.
- **Context or Environmental Data.** This describes important features of the environment, the targeted population, or the problems faced. It is often identified in the project design stage, with tools known as gap analysis or need assessments, as part of the clarification of the need or performance gap to be addressed. This context information is used in the evaluation to examine outcomes in relation to external or exogenous variables other than the project activity (treatment), such as demographic characteristics of the student population, funding levels, competing projects or new initiatives, and political support. For example, project managers might be interested in knowing if student characteristics such as family income, grade level, or familiarity with English have any effect on the outcome. Using this information, project managers can design projects targeted to the special needs of particular groups.

For the evaluation to be useful, project planners must have carefully identified the goals, objectives, interventions, implementation strategies, interim and final outcomes, and context variables. For the projects envisioned here, the project interventions will take some time to develop and produce results. Therefore, progress assessment is important for giving interim results to managers to improve project functioning. This means that the managers must define implementation and interim variables that indicate whether or not the project is heading toward the final desired outcomes.

PROGRESS ASSESSMENT AS AN EVALUATION TOOL

Tools have been developed to help project planners and evaluators track progress over time for both internal and external consumption. One such tool that we believe would be helpful to Challenge Grant managers is known as a progress assessment portfolio (see Figure 1.2). The project portfolio provides a longitudinal record of progress in relation to the project's benchmarks for progress; it describes the work of participants as the project progresses. It offers ongoing suggestions for realignment of upcoming goals and recommendations for future work. Creating the portfolios helps project managers lay out and execute plans for assessing progress, develop formatted information for their different audiences to portray the changes taking place as a result of the interventions, and collect information useful for internal decisions and attempts to improve project performance.

We suggest that a portfolio template have five sections. The first section describes the project's goals. The second section discuses student, school and community characteristics; the third portrays implementation levels, interim and later outcomes for major program elements. The summaries of progress and recommended adjustments in project planning or implementation appear in the fourth section of the portfolio. The final section includes data displays to support information given in the body of the document. Again, the descriptions and examples are provided as possible models for portraying the projects' progression.

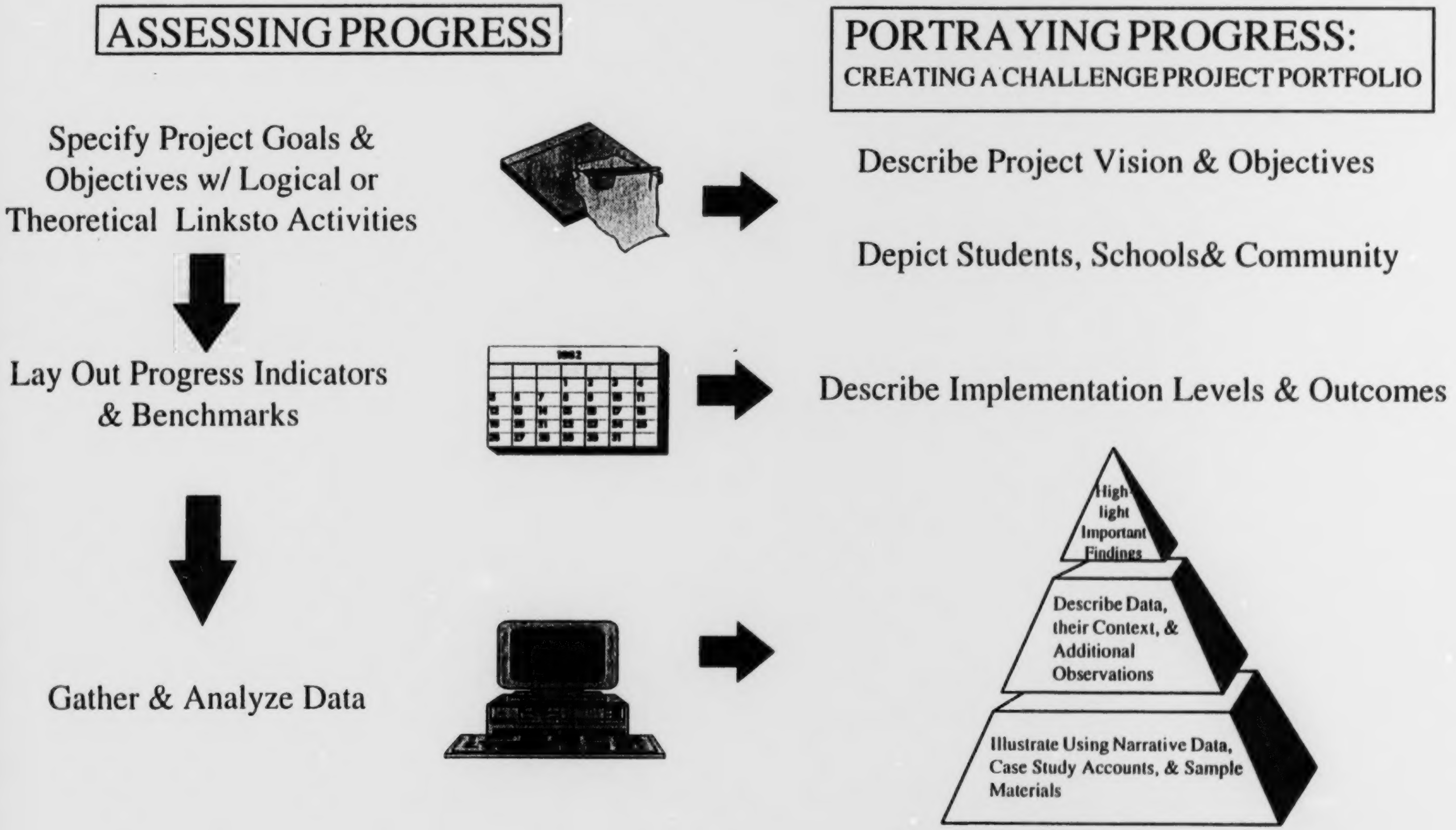
OUTLINE FOR THE REMAINDER OF THE SOURCEBOOK

The next section of the sourcebook provides an overview of evaluation issues facing those responsible for the Challenge Grant projects, with examples from or applications to education technology projects. Section Three then describes a progress assessment portfolio and the steps in progress assessment in detail: developing goals, objectives and interventions, specifying progress indicators, and planning data collections and summaries. Section Four describes how the Challenge Grant project managers and evaluators can use the material in the appendices that follow.

Appendix A contains an overview of the components of a progress assessment and illustrative templates for a progress assessment portfolio. Appendix B is an annotated bibliography for the reader's perusal. Appendix C lists contacts for each Challenge Grant. Appendix D contains sample instrumentation for varied types of data collection. Appendix E is an example of a

FIGURE 1.2

PROGRESS ASSESSMENT



ASSESSING PROGRESS

Specify Project Goals & Objectives w/ Logical or Theoretical Linksto Activities

Lay Out Progress Indicators & Benchmarks

Gather & Analyze Data

PORTRAYING PROGRESS:
CREATING A CHALLENGE PROJECT PORTFOLIO

Describe Project Vision & Objectives

Depict Students, Schools& Community

Describe Implementation Levels & Outcomes

Highlight Important Findings

Describe Data, their Context, & Additional Observations

Illustrate Using Narrative Data, Case Study Accounts, & Sample Materials

Summarize Progress & Challenges, Outline Recommendations for Future Work progress assessment portfolio developed by a design team associated with the New American Schools (NAS)[1].

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[1] New American Schools funded the creation of whole-school designs and teams dedicated to transforming schools according to those designs. We use examples from this private, non-profit effort only as illustrative, not as defining.

2. EVALUATION DESIGN ISSUES FOR CHALLENGE GRANT PROJECTS

This section describes some of the issues likely to be faced in the evaluation of the Challenge Grants. Inevitably, as the evaluation is designed and implemented, practical issues will arise that move the project evaluation from the ideal to the realistic and doable. This section is designed to prompt both managers and evaluators as to some of the evaluation issues that must be faced and some solutions. It focuses especially on evaluation design issues common to education technology projects. The first part of the section addresses issues involving matching the evaluation to a project's unique goals. The second part of the discussion focuses on evaluation issues common to education technology projects as indicated by a review of the literature. The third part of the discussion raises issues specific to the Challenge Grant and its political environment. Finally, the section addresses how the individual project evaluations can be aggregated to support an assessment of the larger program.

CHALLENGE OF MATCHING EVALUATIONS TO PROJECT GOALS

A primary responsibility of the evaluator is to design the evaluation to suit the unique characteristics of the project. We have emphasized already how important statements of project goals, objectives, and activities are to the proper development of an evaluation plan. Within the Challenge Grant program, the projects have varying objectives and interventions that must be taken into account by evaluators.

All Challenge Grants have a common goal: improving student performance. However, content analysis of the grant proposals indicates that the specific objectives or means for achieving that ultimate goal vary by project in large part because the problems faced in each community in achieving that goal differ. Two real, but unnamed, examples give an indication of the variance.

Proposal A describes its community problem as largely rural disadvantaged children having limited exposure to the arts and thereby being underdeveloped "culturally" compared to peers with greater social advantage or living in closer proximity to cultural centers. The solution offered by the proposal is the development of a electronically based network of art curricula that can be integrated with other subjects to be shared among schools in several counties; it also plans professional development for teachers to become experts in the delivery of those curricula. The partners include (among others) museums and other art centers.

Proposal B focuses on poor achievement of disadvantaged urban students in terms of new standards developed by the state in all disciplines. The solution presented is to use computers to increase by one-third the time-on-task in challenging curricula for disadvantaged students. This will be accomplished by increasing the number of computers in classrooms to one per four students, providing a home computer for disadvantaged children at the elementary level, developing new curricula that meet new state standards, and training both teachers and parents to help children access the computers and curricula.

The implications for designing an evaluation for each of these projects differ. First, these two proposals, while both geared toward higher student performance, might use different measures of desired outcomes. Proposal A might focus on increases in cultural knowledge, while proposal B might focus on improved scores on state-mandated tests geared to the standards. The projects also intend effects on different types of students: rural disadvantaged versus urban disadvantaged. Interim measures of progress toward goals would vary substantially. Proposal A might use interim indicators such as numbers of units of curriculum developed or numbers of teachers trained, while proposal B might focus on numbers of computers bought and their use, on increases in time-on-task by students using computers, and on numbers of teachers and parents trained in computer usage.

Our content analysis showed that the original nineteen proposals differed in many areas: problem statements, goals, interventions, grade levels and types of students targeted, disciplinary subjects covered, members of the consortia, etc. This analysis of the differences among proposed projects leads to two propositions.

(1) The evaluation designs of the different projects should take into account the unique goals, objectives, interventions, and desired outcomes.

(2) Evaluators must establish in conference with the project manager these goals, objectives, interventions and desired outcomes and mutually agreed upon measures of performance.

EVALUATION ISSUES FOR EDUCATION TECHNOLOGY PROJECTS

Some projects have characteristics that promote the probability that the evaluator will be able to measure the project impact in practical and meaningful ways. Several recent evaluations of educational technology projects point to benefits associated with the adoption of specific computer-based learning systems such as CAI tutorials and higher-order thinking skills programs (Herman, 1995). These programs and their evaluations followed good sense evaluation rules or procedures that increased the probability that effects would be observable including: well-specified interventions and desired program outcomes, program outcomes that were conducive to being measured, the use of controls to understand the effect of different variables, and a long enough timeline to observe results.

Herman (1995) and Means (1995) report that the benefits of broader-based education technology projects have been less apparent or measurable. Broad-based reforms are those that attempt multiple changes in the school, besides the insertion of a single computer-based course. They might attempt to create constructivist curriculum across all grades and in part supported by computer technology, or they might attempt new technology use in conjunction with major restructuring. Efforts to trace the effects of these projects must take into account measuring effects in dynamic situations where many variables cannot be controlled and where interventions and outcomes have not been well defined for measurement. Any of these project characteristics pose challenges, but not necessarily insurmountable ones, to evaluators because of the difficulties in measuring changes in outcomes and connecting them to the project activities.

We briefly describe below some of the evaluations issues others have dealt with when attempting to measure the impact of educational technology projects that are embedded in larger reform efforts. For additional details, the reader should refer to the original reports listed in Appendix B.

Evolving Project Goals and Interventions

The objectives and activities of educational technology projects often evolve as teachers learn to use the new technology in more sophisticated ways, as technology itself changes, and as the school's need changes. This affects the ability to measure outcomes. Assume, for instance, that the technology itself is rapidly changing and the schools attempt to keep pace with these changes. New equipment and software change the capabilities and the intervention. This in turn changes the ability to produce the desired outcomes and sometimes even changes the outcomes themselves. Over several years, the desired outcome and the one being measured from the baseline might no longer match.

This is likely to happen in the Challenge Grant projects. Several projects intend to develop a funding consortium to increase investments in computers in classrooms or homes. Adding new consortium members in an effort to increase investment funds is a likely part of the growth of the these projects. However, the addition of members comes at a potential cost. Each new member potentially adds its specific goals to the consortium. Over time the goals and objectives of the consortium might change due to new members' interests, political realities in the community, or through deliberate revisions by the participants.

The changes in objectives or the addition of new objectives must be taken into account. Evaluation methods and the design must adapt to the changing project conditions. Evaluators must remain on-top of the evolving nature of the consortium and be prepared to adapt the original objectives and variables in dynamic circumstances.

Technology as a Component of Complex Educational Environments

The environment for education technology projects is usually highly complex and, often, the technology component is not the major thrust of the reform. Rather, it is one of many reforms taking place at once. Many influences, other than the technology activity, will insert themselves into the simple cause and effect relationships hypothesized for education technology. The complex environments in which the technology projects are embedded makes inference of casual relations between project activities and outcomes more tenuous.

Several Challenge Grant projects are embedded in strong state or district reform efforts aimed at improving school outcomes. Simultaneous with the Challenge Grant projects, other school-level reforms will be undertaken, such as the adoption of new standards for achievement, adoption of new curriculum frameworks, increases in professional development funding, etc. These, like the Challenge Grant activities, are intended to change student outcomes. In these circumstances evaluators and project managers must accept that it will be very difficult, if not impossible, to disaggregate the effects of the Challenge Grant on student achievement from the effects of the myriad other reform efforts.

Given this reality, the research design or expectations for conclusive results must be modified appropriately. In some cases, the effects of the project activities might be better understood through the use of controls or comparison groups. If this is not cost-efficient or runs counter to the reform, then an alternative is to use contextual analysis to try to understand the contribution of the technology to the outcomes observed. It is important to avoid attributing outcomes solely to the effect of technology. Implementation analysis will increase in importance in these circumstances as it will help determine if different reforms were implemented and having an effect.

Ambitious Project Goals

Technology projects, and indeed most education reforms, are undertaken in a climate of political bargaining that requires project leaders to pose ambitious and broad goals in order to garner political support. This makes it likely that technology projects and their activities might not be able to meet the ambitious project goals set for them.

This circumstance is often referred to in the abstract as a weak intervention. A weak intervention is one where the treatment being provided by the project activity is small relative to the treatments being provided by non-project influences. Thus, the effect of the external influences overwhelms any change due to the project intervention.

For example, proposals that target disadvantaged urban children increase the use of computer-based educational technology to combat low student achievement. These projects are likely to have less impact than the family or neighborhood circumstances of the children, the influences of peers and friends, the influence of television or music, or a great number of other external variables. These external variables are likely to have stronger effects on student achievement than the project intervention. If this is the case, the project is said to be a weak intervention relative to the other influences on the child. In this case, one should expect, all other issues of evaluation aside, that the gain in outcomes would be minimal even if the program is solidly executed.

However, it is important to recognize that the project is weak only when compared to the ambitious goals required by the political climate. An important role of the evaluator is to challenge the project managers to formulate an appropriate match between the activities and the goals of the project. The solution, as politically unappealing as it might be, is to reframe the goals and make them more proportional to the actual resources, activities, and other constraints being faced. Another way of saying this is that project evaluators have an important role to play in setting realistic expectations for outcomes.

Lack of Project Implementation

Alternatively, the evaluation literature provides examples of projects that were never implemented or were poorly implemented. Most often cited is the lack of relevant training and support to teachers to implement new, technology-based curriculum. Projects not put in place will have no measurable effects. Lack of implementation leads to the same small change in outcome measures as a weak intervention, but its causes are different. Distinguishing between weak interventions and poor implementation is important from the point of view of the project managers who would take different action depending on the cause of little or no changes in outcome measures. For this reason, evaluators should encourage an implementation analysis and they should gauge that analysis against benchmarks developed as part of an operational plan. It is the first step in ensuring that any measurable effects are due to the implementation of the project. To ensure that the effects are solely due to the project and that other factors did not contribute to them requires controls or comparison groups.

Evaluation of Projects Seeking Complex Outcomes

Another evaluation issue raised in education technology projects is the probability that technology usage might not directly affect the standard outcomes used in education evaluations such as student test scores. For example, several projects intend to use technology to deliver curriculum designed to promote higher order thinking skills, more sophisticated communication skills, research skills and social skills. These skills are not usually assessed using standard tests. Rather, the evaluation design must develop outcome measures geared to the specific skill development goals of the project. The indicators might be much more complex than test scores. The use of traditional achievement tests will not produce a meaningful evaluation in this instance and project evaluators must develop and use more appropriate measures.

This will be a greater problem for projects that have not adequately described their desired outcomes. Those projects should revisit the first step in strategic planning to identify specific objectives and project activities to configure the full evaluation in appropriate ways. For another set of projects, those that desire very complex changes on multiple fronts, the challenge of creating outcomes measures is more formidable and will require evaluators and project managers to enter into extensive discussions on these issues.

Timing of Expected Outcomes

Because of the confluence of the above factors, complex environments, newly developing interventions, etc., it is highly probable that changes in final outcome measures will not be apparent for some time--perhaps three to five years. This is why observable interim variables become important. They can indicate whether the program is being implemented as planned and whether the intermediate steps toward eventual outcomes are occurring.

While non-technology based curriculum changes take considerable time, technology-based changes take even longer because of the additional time to acquire computers and become proficient in their use. An example indicates why. Projects must gear up by building organizational capacity and purchasing equipment. The equipment must be planned for, purchased, and installed. Teachers and students must be trained on the simple uses of the technology. For projects that require new curriculum, the units must be developed. After training teachers in their proper use, the units must be used by teachers for enough time to gain proficiency. The teachers must not only become fluent in the curriculum, but also adept at the use of technology to support the curriculum. Students must be exposed to the new units for some reasonable period of time before effects can occur. They as well must become fluent in content as well as technology use. The bottom line is that final outcomes might not be apparent for several years. Test scores or other student performances are likely to be the last outcomes to change.

It is the job of the project managers and evaluators to create reasonable expectations for when changes are likely to occur and in what order. Constituencies can demand early results, especially in light of the sometimes large amounts of money spent to acquire technology. The publication or communication of interim outcomes and benchmarks is therefore an important way to provide these constituencies with needed information and should be a major concern of the project manager.

Inference in Longitudinal Studies

The target group is the group of students or other participants that are expected to display measurable changes in behavior. In the case of the Challenge Grants this usually refers to students whose performances are expected to improve. Ideally, the target group is stable over time, allowing the steady measurement of accumulated change over time with the full effect of project. The longitudinal nature of projects ensures that students will drop out of the projects and new learners will be added. Without controlling the target group, the ability to measure effects will be attenuated.

The Challenge Grant evaluations must address this issue. Some thought must be given to expectations for showing effects when the target group is mobile. Alternatives include the use of controls to stabilize the target population to ensure measurable results and the monitoring and documenting of changes in the target group to allow for the proper interpretation of outcomes.

Another aspect of this is that *all* students and teachers, with or without the addition of the project effects, will become more adept at computer usage over the time period being studied. Separating the effects of the project from the more general effects of increased technology usage will be impossible.

EVALUATION ISSUES ASSOCIATED WITH THE NATURE OF THE CHALLENGE GRANT PROGRAM

The above discussion addressed issues that are generic to broad-based education technology programs or projects. The Challenge Grant program and its projects face more specific issues.

Nature of the Interventions. In general, the goal of the projects is to improve student performance. This is an ambitious goal, considering the many problems that children face in attempting to achieve in school. The Challenge projects are only one of many interventions that would be needed to meet the stated goal of the program and to address the problems faced by children in meeting that goal. As such the goal should be considered ambitious in light of the interventions, or the interventions weak in light of the goal. The projects also must be considered as developmental--with full implementation not likely for several years. Therefore, final outcomes will not be evident for some time.

Program Funding. In addition, the projects face funding issues. Congress originally appropriated $27 million in FY1995, but rescission brought the final appropriation to $9.5M. The five-year budget for the program is not fully funded and the number of new grants made available depend on the level of Congressional appropriations. The implication is that the projects probably will be under pressure to show early results in order to justify full funding or further funding. This will likely make the collection of implementation and interim outcome information important to project managers for both internal and external audiences.

Trade-offs between Evaluation and Other Project Needs. Because the evaluations are directly funded with project dollars, project managers must make a trade-off between funding the project and funding the evaluation. This makes it particularly important for evaluators to find ways to make the evaluations worthwhile to the project leadership through timely reporting of information that helps with project improvement. It also poses potential problems to evaluators because they might be the ones carrying negative messages to beleaguered project managers.

The above circumstances argue strongly for a heavy emphasis on solid evaluation plans that over time balance current needs for discretionary funds against the needs for current and future objective evidence of project effects. Project managers and their evaluators must determine now the best plan for their project. They should consider:

- what they need to know at each stage to improve; and
- the minimum or baseline knowledge required to permit final outcome evaluation later on.

MUTUALLY SUPPORTIVE PROJECT AND PROGRAM EVALUATION

The U.S. Congress and ED would like information about the program as a whole upon which to base their funding decisions and upon which to base the project accountability. Thus, appropriate project evaluations must add up to an appropriate program evaluation.

The most obvious approach is for ED to mandate a set of common indicators that would support a program evaluation. However, the unique goals and outcomes sought by the projects, embedded in their evaluations, will not be measured by a single set of indicators, nor should they be. A single set of indicators across projects would change the incentives for project performance and reduce the diversity of approaches that the RFP intentionally encouraged. The Department of Education must balance the need for adequate information upon which to judge program success against the need for project relevant evaluations.

This circumstance argues for a minimal number of common indicators and grouped evaluation of the projects to indicate the benefits and costs of certain approaches. Table 2.1 is a proposed framework for such a set of indicators and descriptors. The table constitutes a possible

Table 2.1
Project Descriptors and Indicators

1.	**Purpose(s) of Project**	
	a) Improving what is learned (Content)	*These descriptors focus on the means by which the project believes its activities will improve the learning of its target population. Each project might assign relative weights to the purposes, since many will see several as important. These could change over time.*
	b) Improving how it is learned (Pedagogy)	
	c) Increasing the opportunity to learn (Access)	
	d) Improving the knowledge resources available to students and teachers (Enrichment)	

2.	**Distribution of Project Expenditures**	
	a) Hardware	*Indicators should be developed that are common across projects. e.g. computers, types of connections, training hours, etc. These should be supplemented by descriptions of curriculum or training. Funds expended might also be indicator.*
	b) Connections and networking	
	c) Training and support	
	d) Content	

3.	**Populations Served by Project**	
	a) Geographic location (e.g. rural)	
	b) Student population targeted (e.g. migrants, poor, ethnic minority)	*Number and composition may vary through time.*
	c) Class of "actor" served (e.g. student, teacher, parent, administrator)	*Relative emphasis may vary through time.*
	d) Component of school served (e.g. Whole school, subject area,..)	*Probably a onetime design feature.*
	e) Number of sites (e.g. single school, multiple schools, multiple districts)	*Probably will vary through time*
	f) Grade level served	

Table 2.1 (Continued)
Project Descriptors and Indicators

4.	**Project Leadership and Staff**	
	a) Leadership and supporting consortia	*This is probably a stable descriptor such as school district technology coordinator or director of non-profit consortia. Other descriptors might include advisory or governing board membership.*
	b) Project staff	
	1. teachers	*A set of descriptors should be developed that will allow the nature of the development and implementation effort to be described.*
	2. administrative staff	
	3. volunteers	
	4. other employees	
	c) Progress toward organizational goals	
	1. comprehensive mission statement	*A set of descriptors should provide indications that the project is being managed in a planfull manner*
	2. strategic plan relating activities to objectives	
	3. operating plan with benchmarks	
	4. functioning consortium with active leadership	
	5. evaluation process linked to project objectives	

5.	**Outcomes Sought**	
	a) New learning communities (e.g. newly networked learners, restructured roles in school, more meaningful engagement of parents)	*As the indicator areas suggest, outcomes may be either intermediate or ultimate outcomes. The learning of students is clearly important. However the fact that new groups of learners have been formed or that classrooms operate in significantly different ways may also be important.* *Individual projects should try to specify outcomes by which they would ultimately like to be measured. It may be possible to group projects by types of outcomes sought in order to aggregate results.*
	b) New teaching behaviors: (e.g. more project based instruction, flexible grouping of students, etc.)	
	c) Improvements in equity (e.g. more use of technology by special populations or by districts with different assets, instruction tailored more effectively to student needs.)	
	d) Student performance (traditional and new measures)	

Table 2.1 (Continued)
Project Descriptors and Indicators

6.	**Notable features of project context e.g.**	
	a) component of large reform effort	*This is not intended to be a taxonomy of features but rather a place to note distinctive qualities of the projects.*
	b) sources of funding	
	c) focus on particular technology	
	d) important use of new class of resource (e.g. museum, library	
	e) etc.	

starting point for developing common indicators and descriptions by the Program Office, the individual projects, and RAND.

These indicators and descriptors fall into six broad categories (which are not wholly distinct):

(1) The instrumental purpose s of the project: how is the project seeking to improve the learning of its target population.
(2) The primary objects of expenditure of project funds.
(3) A description of the population(s) served by the project.
(4) Descriptions of the leadership and organization of the development and implementation work.
(5) Enumeration of the "performance" outcomes sought.
(6) Special contextual features of the project.

3. PROGRESS ASSESSMENT

Tools have been developed to help project planners and evaluators track progress over time for both internal and external consumption. This chapter describes one such possible tool: a framework for project evaluation called progress assessment. It is provided as an example of an approach for tracking and portraying progress. The framework relies on development of a progress portfolio. Creating the portfolio helps project managers to lay out and execute plans for assessing progress and develop formatted information to portray to their relevant audiences the changes taking place as a result of the interventions. This section first describes the purposes of progress assessment and the role of the project manager in developing portfolios. It then describes progress assessment in three steps: specifying Challenge project goals and objectives; specifying indicators of progress and their benchmarks; and data collection and analysis. Appendix A provides formats or templates for creating a portfolio. Appendix E includes an example portfolio for a technology-based project called Co-NECT.

PURPOSES OF PROGRESS ASSESSMENT

The progress assessment tool described herein is designed to help project managers and staff answer the following questions:

- What is the logical model underlying the project activities?
- Are the interventions being implemented and are they observable in the school, home, community?
- Are participants (students, teachers, parents, administrators) making progress in relation to the project's goals?
- Which activities and strategies are aiding participants' progress toward goals?
- Which activities and strategies are impeding progress toward project goals?
- Are students and adult participants benefiting from project activities and strategies?
- What do progress levels (and aids and impediments) suggest about upcoming work and continuing project improvement?

Challenge Project Managers' Role in Progress Assessment

Project managers or evaluators might undertake the following types of tasks as part of the evaluation design:

- Create shared expectations among participants and stakeholders for the project's goals, progression, benchmarks and intended outcomes.
- Gather information about students or other targeted populations prior to project implementation--as a baseline for assessing progress.
- Specify data sources, data collection timelines, and mechanisms for managing early and ongoing data.
- Collect and summarize quantitative and qualitative data about changes in project implementation and outcomes.
- Identify project strengths and challenges, as well as, aides and barriers to implementation.
- Realign project goals and upcoming work where the data recommend it and, thereby, drive continuing project improvement.
- Provide important and necessary accountability information for participants and stakeholders.

SPECIFYING GOALS AND OBJECTIVES

Specification of goals and objectives is step one in the process of establishing shared expectations for the project. Goals and objectives are developed in response to performance gaps identified through gap analysis or needs assessments. This process draws on the talents and views of school staff, parents, and other project stakeholders. Progress assessments begin with a mapping of the primary and secondary goals of the project. Challenge Grant managers would specify goals and objectives in major areas and state their comprehensive aims for student improvement.

Sample Project Objectives

Goal statements should reflect major project efforts. For example, Co-NECT designers describe their global goal for technology use in this way:[2]

> The Co-NECT design provides a vision of a technological infrastructure featuring unimpeded access to video, computer and software tools for all members of the learning community, and a flexible communication network linking all computers in the school with each other, and with computers around the world.

Given that goal, the project managers at a Co-NECT school might set the following objectives for professional abilities and, therefore, professional development:

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[2] Co-NECT is one of the NAS designs. One of its purposes was to increase significantly the use of education technology in schools using its design.

- Teachers will be able to develop and deliver video and broadcast productions of their work and school events and transmit this knowledge to students.
- Teachers will be able to learn about and make frequent use of computer technology, as well as word processing, spreadsheets, data bases, Internet browsers and other communication tools and transmit this knowledge to students.
- The school will establish an Internet connection and local area network and teachers will utilize the capacity for communication, data access, and professional collaboration and enable students to do likewise.
- Teachers will access technology coordinators provided by the school to promote and support wide availability and widespread use of video equipment, computers and software tools and enable students to do the same.

These teacher professional development objectives make concrete the vision for improvement. Managers draft corresponding statements of the project objectives for major project elements or components. The steps in progress assessment are shown in Figure 3.1.

SPECIFYING PROGRESS INDICATORS

In specifying indicators, Challenge Grant managers should think about the kinds of data that signify progress for students and schools. Both indicators of implementation as well as distant, harder-won measures of progress and project outcomes should be specified.

Three categories of indicators well-suited to assessing the initiation, implementation, and effects of Challenge projects are implementation observables, participants' judgments, and outcome indicators. The first and last were mentioned in the framework in Section 1. Participants' judgments represent a data collection method, but one that should be highlighted here. All three have utility for assessing progress and fostering project improvement.

Implementation Observables

The first category of indicators includes data about things we call implementation observables. They are important to determine early on whether project components are, in fact, being implemented. Implementation evidence is needed to gauge progress, frame project adjustments, and understand outcomes--or their absence. These observables are the manifestations of the implementation of an intervention; they are things observers can see in a school building, home, community center, etc., that suggest the project is under way. For example, evidence of implementation of projects might be indicated by the existence of:

FIGURE 3.1

ASSESSING PROGRESS

Specify Project Goals & Objectives with
Logical or Theoretical Links to Activities

↓

Lay Out Progress Indicators & Benchmarks

↓

Gather & Analyze Data

- Mission statements, operational plans, and evaluation plans.
- New resource allocations and technology investment funds.
- Training plans and sessions on new technology.
- Curriculum quality review teams or curriculum development teams.
- New standards or assessment workshops.
- Technology planning teams and their development of technology plans.
- Community meetings about how to foster technology use.

The existence of these groups and activities, in some cases, shows that participants are engaged in the hard work of project implementation. In others they are necessary, but not sufficient, precursors to the availability of pivotal project resources--like technology-based curriculum units, standards statements, hardware or software. Their "observability" does not support statements about the value of the project outcomes. As progress assessment proceeds, data should be gathered to support judgments of quality and effectiveness.

Implementation likewise might be suggested by indications that the consortia has developed plans for or actually put in place important relevant components of the intervention, such as:

- Computer and technology centers.
- New personal computers and software.
- Parent and community volunteer programs.
- Student performance standards.
- Curriculum units and lesson plans effectively incorporating technology.
- Interdisciplinary or project-based instructional materials effectively incorporating technology.
- Project-related technology and supports.

In many cases, statements about implementation observables can and should go beyond assertions of presence or absence; the data can show the levels at which indicators are present. For example, helpful information about the depth of implementation would be obtained by counting accomplishments: the number of completed curriculum units, number of faculty completing professional development on new technology or using the Internet, number of parents using computer technology, or number of businesses and non-profits participating in the consortia.

For those projects involving teacher professional development, for instance, the following quantitative observables about implementation would be informative:

- Amount of time devoted to professional development during the year (with indicators of spacing over the year).
- Amount of time set aside for teacher collaboration on technology-based curriculum during the year (with indicators of spacing over the year).
- Number of days of professional development devoted to technology during the summer or throughout the year.
- Number of teachers participating (and electing not to) in technology professional development.

As the project proceeds, it would be important to learn whether these are associated with positive changes for teachers and ultimately for the project.

Implementation observables for different areas of educational change are given in the Table 3.1 as examples of what might be considered. These may help stimulate users' thinking about meaningful indicators of project initiation and implementation.

Participants' Judgments

Participants can provide invaluable information about implementation progress and perceived project benefits. The judgments of students, teachers, administrators, parents, and project staffs are important inputs for progress monitoring. Traditional project evaluation paradigms rate the information value of perception data lower than more direct data on implementation and outcomes; however, in education reform in uncertain and complex settings, their utility to the project manager for improving the project can be high. The buy-in and sustained support of participants are likely to be (at least minimally) related to the quality of participants' efforts. In light of the sometimes struggling efforts of technology-based projects, it is important to solicit and collect good data on participants' perceptions. Minimally, they suggest to the project manager needed project refinements; they additionally provide estimates of project effects.

Table 3.1

Implementation Observables

Standards and Assessment

- Standards statements
- Schedule of training and materials given to teachers to help them understand new standards
- List of names of members of local standards committees and example minutes of meetings
- Copies of materials given to students, parents, and/or community members explaining new standards
- Available documentation on the links between standards and curriculum, and standards and assessments
- Schedule of training and materials given to teachers to do portfolio assessments and other new assessments
- Samples of portfolios assessments
- Samples of alternative assessment tasks not part of portfolios
- Statements of examples of scoring criteria for portfolios and non-portfolio assessments
- Documentation of changes in student achievement
- Documentation on the links between curriculum and assessments

Curriculum and Instruction

- Examples of lesson plans, units of study, etc.
- Number of lesson plans or units of study developed versus number remaining to be completed to cover full curriculum by grade level
- Sequence across grades of new curriculum (schedule for a student)
- Other changes to courses, course content, and course sequencing
- Documentation of connections to community in curriculum areas
- Description of quality control mechanisms in place for newly developed curriculum. For example, teacher peer review, review by design team, etc. And, evidence of subsequent changes or dropped units (for example, five units dropped after peer review)
- Schedule of training and materials for teachers for new curriculum
- Schedule for completion of all required curriculum units
- Schedule for adoption of instructional strategies
- Schedule and materials provided teachers for new instructional strategies
- List of places teachers use for community as classroom
- List of when the community has come into the classroom - speakers, performers

- Example of schedule that allows for students' individual choices

School Organization
- Teachers' school day schedule demonstrating time for teaming, curriculum writing, paperwork, etc.
- Documentation of new/changed staffing patterns including master teachers, apprentices, aides, volunteers, facilitators
- List of new grade combinations, teacher team combinations, etc., and when they went into effect
- Relative number of classes covered by these new combinations versus classes that have not converted
- Description of student placement procedures

Teacher Professional Development
- Schedule of teacher professional development meetings
- Workshop materials
- Workshop attendees roster
- School visit agendas
- Documentation of ongoing teacher collaboration

Technology Use
- List and location of newly purchased, project related equipment (classroom, labs, principal's office)
- Schedule for purchasing more project-related equipment
- Schedule and materials for training
- List of software programs/packages used
- Examples of curriculum units incorporating technology

School Governance
- List of names of members of various committees required by design
- Schedule and materials for training in new governance roles
- Schedule of committee meetings and examples of minutes from meetings
- Significant products of the committees, such as new schedules for courses, standards for exemplary student products, new standards, plans for technology, school improvement plans
- Newly developed rules, regulations, master contracts, site-based management plans, waivers, and district-school agreements about school level control over budget, hiring, firing, evaluation, or mission
- List of incentives to encourage new behaviors
- Master contract changes to accommodate these roles
- Grievances filed concerning new roles
- Hiring/layoffs due to design implementation
- Description of new roles for administrators

Family and Community Services
- Name of social services coordinator for school

- Schedule for different activities
- Indicators of utilization of or participation in these services

Public Engagement
- Schedule of public meetings
- Materials explaining project for parent and community audiences
- Materials explaining project for education stakeholder audiences
- Samples of newspaper articles and newsletters for lay consumption
- Community volunteer roster
- Business/nonprofit participation agreements

Partnerships
- Statements of partnership objectives
- Schedules for and minutes from partner meetings
- Products jointly developed by partners
- Evidence of success in raising matching funds
- Evidence of success in gaining new partners
- Evidence of efforts to strengthen partnerships and common agendas

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Student and adult participants can offer useful perspectives on:

- Project clarity.
- Implementation feasibility.
- Resource availability (to support and sustain implementation).
- Levels of implementation and observability.
- Quality of project guidance, resources and activities.
- Satisfaction with student progress.
- Presence of early (then ongoing) project benefits to students and other participants.

For various of the Challenge project elements, for example, participants might be asked to address:

- The quality, comprehensiveness, and appeal of the curriculum.
- Their satisfaction with associated instructional strategies.
- Perceived levels of student engagement in the project.
- The degree to which students seem to be learning better because of the project.
- The degree to which teachers seem to be teaching better because of the project.

- The teachers' satisfaction with their changed roles.
- The quality of products issued by management or topical committees (e.g. curriculum, technology, etc.).
- The perceived usefulness of technology to students, teachers, and project managers.

These data would provide important direction for project efforts. For several of these areas (e.g., student engagement and achievement levels), more direct assessment also is possible and should be pursued. Using teacher professional development to illustrate, teachers might be asked for their perspectives on:

- Their level of understanding of project intentions.
- The quality of professional development materials and experiences.
- The usefulness of new practices and subject matter presented at workshops.
- Their facility with strategies, protocols and equipment presented by the workshops.
- The benefits of teamwork and ongoing teacher collaboration.
- Suggestions for neglected professional development topics and areas for future improvement.

Administrators' judgments on these matters also would be informative. Data on Challenge Grant participants' perceptions could be collected in numerous ways (surveys, progress rubrics, interviews, focus groups).

Interim and Final Outcome Indicators

Like economic indicators, outcome indicators describe the health, quality or effectiveness of the system. They have meaning when they are compared to something; outcomes can be compared to themselves over time and/or to agreed-upon standards for success. They correspond more closely to conventional notions of accountability than the types of evidence described to this point. Managers might look for the impact of their work, for example, in increased student engagement, parental involvement, and teacher retention (in the project). They might realize growing community support or business participation. They might look for increased numbers of students meeting high standards on state performance assessments and for fewer students in the lowest score categories. Managers might look for declines in disciplinary referrals and special education placements.

Examples of outcome indicators for different project elements include those addressing:

- Levels of student engagement in project activities.
- The degree to which students are learning better in the project (as measured by performance-based assessments).
- The degree to which teachers are teaching better in response to project (as measured by technology-based "good practices" indicators).
- Involvement of project constituents in public engagement efforts.
- Results of ongoing attempts to keep and build support.

Unquestionably, some project outcomes are more easily and directly measured than others. Direct measures of student engagement, for example, can be made by trained observers recording student time on-task and off-task over a number of occasions. This type of data collection is time- and labor-intensive. Alternatively, an indirect measure of engagement might be afforded by student attendance levels, homework completion rates, or rates of participation in project activities. These indicators would serve as proxies for more direct indicators of student engagement. Though they are not ideal indicators of engagement, they provide reasonable information given the time, cost and expertise needed to index them.

Turning for a moment to student performance measures, it is important to recognize that they must be aligned with project goals if they are to clearly indicate project progress. Student achievement data should come from assessments that focus on the student competencies addressed by the intervention. In the context of some Challenge Grants, students' accomplishments might be best described by performance assessments (also called authentic assessments and constructed-response tests), portfolios, learning records, and exhibitions. Several states have developmental or operational performance assessment programs in place. These are designed to represent the complex, important skills the states seek to promote.

When appropriate as part of the progress assessment data should be compiled on norm- or criterion-referenced tests. Appropriateness in this context means that the norm- or criterion-referenced test measures the outcomes sought by the project or an important set of outcomes that cannot be ignored in assessing student performance (i.e., that declines in test scores would not be a desired outcome even if they do not exactly match the new performances sought.) When appropriate, the project managers should try to check stakeholders' attempts to depict standardized test data as the sole hallmarks of project success or failure. Other assessment instruments, if better aligned with project efforts, should be used. Reporting of multiple and varied progress indicators is a preferable option to reporting a single indicator, especially if it does not match project goals well.

School Outcomes

Managers typically assess progress against a number of school improvement objectives. These cut across project areas (standards and assessment, curriculum and instruction, professional development, etc.) and speak to educational effectiveness generally. These are broad objectives for improving school performance. For example, most school districts strive to improve student attendance levels; reduce dropout rates; effect successful transitions to work, the military, and post-secondary education; and increase teacher attendance. Objectives for the school should be specified in the same way that statements are laid out for individual project areas. Relevant data should be tracked at the outset and as the project matures. A number of commonly cited school outcome indicators are listed in Table 3.2.

As earlier noted, managers should catalogue school performance right from the outset. Early and ongoing data collections will allow participants and observers to track change over time. In fact, where feasible, the status of key indicators prior to design implementation should be recorded; pre-implementation data will serve as a baseline for assessing progress.

SPECIFYING PROGRESS BENCHMARKS

For each indicator of interest, benchmarks (hoped-for accomplishments or milestones) should be specified for key points in the project's life; that is, Challenge managers should record what they will strive for and reasonably can expect by way of implementation progress. For example, benchmarks for the numbers of expected curriculum units developed, teachers asserting they fully understand the project, teachers using technology tools on a daily basis, and students scoring at proficient levels on performance assessments could be laid out.

Project stakeholders with different interests and prior beliefs should be called upon to help map benchmarks; alternately, they can be asked to review benchmarks before final adoption. The conversations that are key to forecasting accomplishments help promote shared expectations for progress. Making aims concrete for different project areas and time-frames gives stakeholders a chance to weigh in on the implementation and evaluation plans. It provides participants with an opportunity to share their views and hear the perspectives of others. Specification of benchmarks over time provides foreknowledge of the pace at which improvement is expected.

The benchmarks would serve as progress standards. Participants might indicate what they hope to see at the end of each of the first and second years; they also might note sought-after progress and outcomes by the end of year four. Table 3.3 presents an example for a consortium seeking to increase students' academic motivation levels.

Table 3.2

School Outcomes

Student Performance Indicators

- Attendance rates
- Homework completion rates
- Special education referrals and placements
- Promotion rates
- Graduation rates
- Rates of disciplinary referral, suspension and expulsion
- Drop-out rates
- Tardiness levels
- Numbers of students with one or more failing grades
- Numbers of students performing at or above grade level in language arts and/or math
- Test score information or other performance assessment standings
- Average high school course loads taken
- Numbers of students taking the SAT or ACT Assessment
- Numbers of scholarships/honors awarded to seniors and other students
- Rates of participation in school activities/organizations
- Technical school enrollment or entry into military service
- College placement rates, major selection and non-remedial college course enrollment
- Technical school and college advanced course completion rates
- Technical school and college program completion rates
- Entry-level job placement and job performance levels
- Number of students on waiting list for program or school

Program Outcome Indicators

- Instructional staff absence rates
- Retention of teachers in the school/project
- Numbers of applicants for open teaching positions
- Average teaching experience and degree status of newly-hired teachers
- Parent/teacher conference participation rates
- PTA and other parent meeting participation rates

- Parent volunteer rates
- Campus substance abuse, violence, and criminal activity rates
- Numbers and outcomes of fundraising efforts by parents and community members

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For each project objective, Challenge Grant managers must specify progress indicators and progress benchmarks. As illustrated by Table 3.3, indicators and benchmarks should be recorded for important time intervals.

DEVELOPING DATA COLLECTION PLANS

The last step in initiating a progress assessment is deciding upon data collection methods, data sources, timelines and data analysis approaches. The assessment probably will rely on a mix of information-gathering methods, including both qualitative and quantitative approaches.

Table 3.3

Progress Indicators/Benchmarks

School Improvement Goals	Indicators	Spring 1996 Benchmarks	Spring 1997 Benchmarks	Spring 1999 Benchmarks
Objective 25: Increase students' academic motivation	Attendance rates	85%	87%	90%
	Disciplinary referral rates	10%	8%	5%
	% of students with ≥1 failing grade	18%	17%	14%
	Drop-out rates	8%	7%	5%

Data Collection Methods

The following data collection approaches may yield meaningful and useful data on Challenge project implementation and progress:

- Observables inventories.
- Classroom or home observation checklists.
- Surveys.
- Interviews.
- Focus groups.
- Document reviews.
- Audio or video record reviews.
- Student assessments (authentic and/or traditional).
- Student portfolios or learning records.
- Student projects or demonstrations.

- Teacher logs or portfolios.
- Progress rubrics.

These should be devised to gather information on the specified progress indicators. Though description of the strengths and limitations of these data collection approaches is beyond the scope of this sourcebook, the methods are described briefly to help readers locate additional relevant information. Good discussions appear elsewhere; several are referenced in Appendix B.

Observables inventories and classroom observation checklists can be used to guide and record observations of classrooms and schools. The former are helpful in inventorying hardware, software, documentation, products, and other resources that are concrete manifestations of project elements. The latter are constructed to yield data about what is happening in the project (rather than what people believe and say is occurring). Typically conducted by trained observers, observations can provide information about the types of actions or behaviors the intervention promotes. Observational data can be invaluable in making sense of other project data and in devising recommendations for project improvement. These methods are labor- and resource-intensive because they require substantial amounts of training and observation time; an additional disadvantage is that participants' behaviors may change when and because they are observed.

Surveys, interviews and focus groups are useful for obtaining information about the attitudes and opinions of participants and project stakeholders; they also can be developed to collect descriptive information about the respondents' characteristics. Surveys can cover a broad range of topics, be administered to a substantial number of individuals, and are relatively inexpensive. Interviews are better suited to more complex questions and open-ended responses; they can provide richer, more interesting data. Their disadvantage is that they take longer and are more difficult to analyze. As an information-gathering technique, focus groups bring together individuals to discuss topics salient to the progress assessment. The moderator must be skilled at leading discussion groups; this is an inexpensive and quick information-gathering tool. All three methods may yield data colored by participants' need to provide socially desirable responses.

Reviews of existing documents, databases, audio, and video records sometimes can provide good information about the comprehensiveness, depth, and quality of project resources and activities. Existing records may provide good illustrations of data gathered using other means. They also can point up underdeveloped areas.

Progress rubrics can be designed for use in summarizing reform accomplishments in given project areas. Rating forms can speak to progress seen by way of observation, survey data collection, document review and other methods. The scales can include categories anchored by descriptions of plausible progress levels. For projects developing curricula, for example, a rubric might be devised to index progress in curriculum development and documentation. The strong rating category might say the curriculum is largely developed and documented. The good case might say that development is well on its way and much is documented, and the limited case might say that curriculum is evolving and much remains to be documented.

Student performance indicators--including traditional student assessments, performance assessments, student portfolios, learning records, projects and demonstrations--are key data collection instruments in progress assessment. Suggestions for analyzing performance assessment data are given below. Teacher portfolios and logs are analogs to student work collections and journals (or logs). They provide a means of examining teacher products over time, including instructional units, student assessments, committee documents, and other program documents or contributions.

Data Sources and Timelines

Sources of data about implementation levels and outcomes include students, teachers, administrators, parents, community members, and designers. Project records--including committee minutes, project logs or products, workshop materials, and student and personnel files--are important information resources, as are existing external information sources, such as school and system-level records and databases.

Data Analysis Methods

As was the case for data collection approaches, careful descriptions of analytic techniques are beyond the scope of this guide. Good treatments of methods likely to be useful in progress assessment are listed in the bibliography. Only a cursory discussion appears here; its intent is to give the reader enough information to find appropriate references.

Many of the data generated by progress assessment can be presented meaningfully as counts or percents. Data for implementation observables, for example, often are usefully provided as counts. Multi-categorical data can be summarized using frequency distributions and measures of central tendency. Score data from student performance assessments generally are multi-categorical. Performance assessment scores typically correspond to four or five proficiency levels. Score distributions showing the number and percent of students at each level gives readers information about typical student performance and the proportions scoring in the highest and lowest categories. Provision of a median (the point dividing the distribution in half) and mode (the most frequently occurring data category) additionally summarizes frequency data.

Shifts in score distributions over time--showing fewer students at the lowest score categories and increases in average performance--are telling indicators of student progress.

In producing frequency displays for data with many categories, the analyst generally examines detailed distributions and summarizes them using tables or graphs. If the analyst wants to describe the data using a single figure, an arithmetic mean (average), median or mode can be used; the range (lowest and highest points) and an indication of variability also is helpful.

In some cases, managers would want to create subsets of the data and describe them separately for varied types of respondents (e.g., teachers, parents, and administrators; or new teachers and veteran teachers). Cross tabulations of the data provide the needed information. Approaches to testing the statistical significance of group differences rely on t-tests, chi-square and variance analyses. The strength of the relationship between two variables can be described using correlation coefficients.

No matter which analytic tools are employed, the final step is to author texts and develop tables and graphs to describe salient findings in terms that will resonate with stakeholders.

The Appendices provide formats and an example of the progress assessment portfolio. They are suggestive and illustrative, but not prescriptive.

4. NEXT STEPS: HOW CHALLENGE GRANT PROJECTS CAN USE THESE MATERIALS IN THEIR EVALUATION

As noted, this sourcebook was developed to help Challenge Grant recipients design and implement their project evaluations. The document was prepared as background to and support for a ED meeting of Challenge Grantees in winter 1996, and redrafted to have utility on a more enduring basis.

Initial sections of the sourcebook discussed the complexity of the projects and of the design and measurement issues that bear on their evaluation. An example framework for project evaluation called progress assessment was presented in section three and examples were given of the types of goal statements, benchmarks, and data gathering/analysis methods that might apply to evaluation of the Challenge projects.

Appendix A provides an example template for portraying the results of a progress assessment. The template shows the components of a progress portfolio and gives worksheets for specifying goals, benchmarks, and data collection activities.

Appendix B is an annotated bibliography on educational evaluation and, in particular, on the evaluation of technology-based programs. Some of the entries correspond to resources about general issues in evaluation. Others describe evaluation challenges and techniques. References to electronic documents also are given.

Appendix C lists the contacts for the projects.

Appendix D is a collection of evaluation planning and data collection instrumentation. These come from a number of sources, and again, are meant to be illustrative. Several come from Challenge Grant applications, others from the literature, and a number from projects supported by the New American Schools, sponsor of the Co-NECT program. The surveys, interview guides, observation checklists, and other data collection and planning tools/products are included as examples of relevant formats and content. None can be adopted wholesale. They serve as examples. Some might be adapted and revised to reflect project goals and lines of inquiry.

Appendix E provides an example project portfolio. The progress portfolio was developed by project designers and evaluators for the Co-NECT school design. The Co-NECT project was undertaken by a group within the Educational Technologies Department of Bolt, Beranek and Newman, Inc. Not dissimilar in conception to some of the Challenge projects, the Co-NECT design has five elements: school-based design, performance assessment, project-based learning, professional community, and use of technology. At the time of the excerpted report, the design had been implemented in three sites. The Co-NECT progress portfolio describes their work, accomplishments, and challenges. It serves to illustrate the portfolio template.

In using these and other tools and in other matters of design and measurement, RAND will provide technical assistance to Challenge Grantees upon request. We will facilitate discussion and sharing across projects on issues of evaluation. We look forward to your input on potentially useful models, instrumentation, and other materials.

A. CREATING A PROGRESS ASSESSMENT PORTFOLIO: FORMATS AND TEMPLATES

This appendix provides a sample template for developing a *Progress Assessment Portfolio*. The portfolio is meant to provide a longitudinal record of project progress in relation to intents and design features. As described earlier, the assessment is designed to elicit varied and rich data about initial implementation levels, early outcomes, and--over time--later indicators of challenge grant progress and project effects. The progress portfolio would record things assessed, refined and learned. It would highlight successful project elements and point out remaining challenges. The portfolio offers suggestions for upcoming work and fosters project improvement.

The portfolio would additionally seek to provide important and necessary accountability information for numerous stakeholder audiences, including state and local officials, parents, community members, founders, and fellow reformers. The portfolio would help establish the agenda for ongoing improvement and promotes fuller and continuing understanding of progress for present and future innovators.

PROJECT PORTFOLIO TEMPLATE

The portfolio template has five sections; it includes:

- A statement of the project's vision and objectives.
- A description of the student population, school and community.
- Descriptions of initial implementation levels, early outcomes, and--over time--later indicators of progress and project.
- A summary of progress and challenges, with recommendations for future reform work.
- Appendices providing data displays to support the body of the portfolio.

The parts are depicted in Figure A.1 and described below.

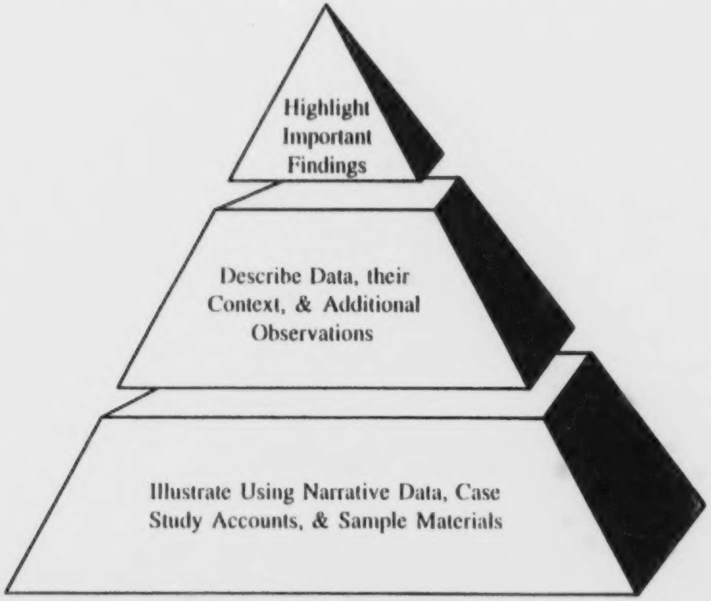
FIGURE A.1

PORTRAYING PROGRESS: CREATING A CHALLENGE PROJECT PORTFOLIO

Describe Project Vision & Objectives

Depict Students, Schools & Community

Describe Implementation Levels & Outcomes


Highlight Important Findings

Describe Data, their Context, & Additional Observations

Illustrate Using Narrative Data, Case Study Accounts, & Sample Materials

Summarize Progress & Challenges, Outline Recommendations for Future Work

The Design and Program Vision

The portfolio begins with a short portrayal of the project and the vision for reform. The direction of major project efforts is described, as are the student and program outcomes sought. This introductory section sets the stage for the data summaries to follow. Most authors will elect to precede this introductory section with an Executive Summary, providing an encapsulated version of the project description, discussion of progress and challenges, and recommendations for future work.

Description of the School and Community

Section two provides a description of the school and its community. Discussion of district and school characteristics, family and student characteristics, school staffing and budget levels provides useful contextual information. Supporting data might appear in the appendix to the portfolio.

Description of Implementation Levels and Outcomes

This section of the portfolio reports the most telling and important information about implementation levels and outcomes. Narrative and graphic progress summaries would appear for each major project area (curriculum and instruction, standards and assessment, school organization, teacher professional development, etc.). Additionally, available comprehensive student and project data are reported, including attendance, promotion, graduation, drop-out, college placement, parent and community involvement rates, and so on.

For each major project area (and for the comprehensive project data), the information is organized as an information pyramid. The top level of the information pyramid is meant to give a short, directed portrayal of the most interesting information about implementation and outcomes. Results might be presented in bulleted format to make easier the reader's review of findings and progress. The second level gives a more extended, descriptive and qualified discussion of the data and their context. Easy-to-read tables and graphs might appear in the second level. The third level includes case study reports, narrative data, or sample materials to illustrate and maker richer the information provided in the top level.

Summary of Progress, Challenges and Recommendations

The fourth part of the reform portfolio provides a summary of key program accomplishments and a discussion of remaining challenges. Where needed and in light of reformers' observations, suggestions are made for realignment of plans and program goals. Again, the final section of the portfolio is its appendix section which would include data summaries supporting information provided in the body of the portfolio. At each installment of the portfolio and as the project is informed by experience, more numerous and telling information about progress and project outcomes will be offered.

EXAMPLE FORMATS

The remaining pages in this appendix are examples of formats that could be used to display the information gathered in the progress assessment.

B. ANNOTATED BIBLIOGRAPHY

This annotated bibliography is organized according to themes found in the literature. It is intended to be a living document as more materials are received and reviewed it will be expanded.

I. Evaluation: A General Overview

Patton, Michael Q. (1986). ***Utilization-Focused Evaluation*** **(2nd Edition). Newbury Park, CA: Sage.**

In a book that combines both the theoretical and the practical, Patton examines how and why to conduct evaluations. In this revised and updated edition, the author provides practical advice grounded in evaluation theory and practice, and shows how to conduct evaluations from beginning to end in ways that will be useful--and used. This volume discusses the ferment and changes in evaluation during the eighties and the tremendous growth of "in-house" evaluations conducted by internal evaluators. Patton also discusses a methodological synthesis of the "qualitative versus the quantitative" methods debate, as well as the cross-cultural development of evaluation as an internationally recognized profession. *

Stevens, F., Lawrwenz, F., Sharp, L. (1993). ***User-Friendly Handbook for Project Evaluation: Science, Mathematics, Engineering and Technology Education.*** **Alexandria: National Science Foundation.**

A basic overview of the process of evaluation. Questions addressed include: how do you develop evaluation questions, how to determine what data collection techniques to use, how do you communicate results.

II. Issues in evaluating technology

A. Positive Examples

Cognition and Technology Group at Vanderbilt (1992). The Jasper Experiment: An Exploration of Issues in Learning and Instructional Design. ***Educational Technology Research and Development*****, v.40, 65-80.**

This report discusses the progressive and highly regarded "The Adventures of Jasper Woodbury" series. Students are shown videotapes of a story line which includes all the relevant information needed to solve a set of problems. The series emphasizes complex, open ended problem solving. Programs are based on cognitive theory (which stresses the importance of active knowledge) and are structured to support constructivist learning. They are also designed to foster cooperative learning. Part of the program's success is due to the fact its researchers and developers were very involved in the program's implementation.

Means, B., Olson, K. (1994). The Link Between Technology and Authentic Learning. Educational Leadership, v.7, 15-18.

This article uses a technology program at the Frank Paul Elementary School to outline the criteria for successful projects: an authentic, challenging task, a project where all students practice advanced skills, where work takes place in heterogeneous, collaborative groups, the teacher acts as coach and provides guidance, and where work occurs over extended blocks of time.

Means, B., Olson, K., Singh, R. (1995). Beyond the Classroom: Restructuring Schools with Technology. *Phi Delta Kappan*, September 1995, 69-72.

The authors observe that successful technology programs require a "coherent, school-wide instructional vision--a consensus around instructional goals and a shared philosophy." The article also offers recommendations about ways to make teachers comfortable with technology, and discusses creative ways for schools to make the most of limited computer resources.

Niemic, R.P., Walberg, H. (1985). Computers and Achievement in the Elementary Schools. *Journal of Educational Computing Research*, v1(4), 435-440.

This summary of a comprehensive meta-analysis of computer assisted instruction (CIA) research provides statistical data to illustrate the success of this method. Conclusions are drawn about CIA's effectiveness in different student populations.

Riel, M. (1989). The Impact of Computers in Classrooms. *Journal of Research on Computing in Education*, Winter 1989, 180-190.

This report to the National Education Computing Conference charts a study that introduced computers into four elementary school classrooms. The author discusses the project from start to finish, giving a good sense for how this type of research is facilitated and evaluated. She concludes that this study was extremely successful largely due to the emphasis placed on contextualized learning, i.e., kids can use what they learn at school in the "real world."

B. Difficulties in Evaluating and Implementing Technology Programs

Dwyer, David (1991). Changes in Teachers' Beliefs and Practices in Technology-Rich Classrooms. *Educational Leadership*, v48(8), 45-52.

In an analysis of the Apple Classroom of Tomorrow program, Dwyer highlights the difficulties teachers have adopting the technology to the way they currently teach and then making the transition to actually inventing new instructional methods that incorporate the resources they've been given. The author also charts the different phases of the project and discusses the different expectations teachers had through the course of these phases. A table lays out these expectations graphically.

Herman, Joan (1994). Evaluating the Effects of Technology in School Reform. In Barbara Means (Ed.), *Technology and Education Reform: The Reality Behind the Promise* (133-167). San Francisco: Jossey- Bass.

A look at the difficulties of evaluating technology-based innovations in education: imperfect research environments, implementation problems due to time constraints and lack of adequate exposure to the technology, and imperfect longitudinal study environments due to student attrition or lack of funding. The article includes a mock project that is then analyzed for problems.

Stevens, F., Lawrenz, F., Sharp, L. (1993). User-Friendly Handbook for Project Evaluation: Science, Mathematics, Engineering and Technology Education (Chapter 5). Alexandria: National Science Foundation.

An fictional example of a troubled study. The evaluation recorded here lacked progress evaluations, relied only on a single measurement, and misinterpreted data because they did not disaggregate results. Good example of problems to avoid.

C. Ideas for Improved Evaluations

Gearhart, M., Herman, J.L., Baker, E.L., & Whittaker, A.K. (1992). *Writing portfolios at the elementary level: A Study of new methods for writing assessment* (Tech Rep 337). Los Angeles: University of California, Center for the Study of Evaluation.

A study about evaluating writing ability through the Writing Portfolio method as opposed to the standard timed test of old. The portfolio method includes both completed work and rough drafts. In her overview Herman applauds this method because it allows the evaluators to see the word processing capabilities students have developed. This report includes a rating scale for how to rate writing.

House, Ernest R. (1993). *Professional Evaluation- Social Impact and Political Consequences.* Newbury Park, CA: Sage.

The author is a professor in the School of Education at the University of Colorado and an experienced evaluator of major social and educational programs. In the author's own words, this book: "is about analyzing the social, political, economic, historical, and cultural influences on evaluation." It provides a thoughtful overview of the field's evolution, from its earlier reliance on "value-free" experimental and primarily quantitative methods to the current emphasis on methods more appropriate to the diverse, multicultural, and politically charged environment in which social and educational programs operate.*

Linn, R., Baker, E., Dunbar, S. (1991). Complex, performance-based assessment: Expectations and validation criteria. *Educational Researcher*, 20(8), 15-21.

The authors argue that a direct assessment of performance skills is the key to valid assessment results. A set of criteria that are sensitive to some of the expectations for performance based assessments is proposed. Technology provides the instrument to measure direct performance.

Lomask, Michal S., Jacobson, L., Hafner, L. (1995). The Development and Validation of an Assessment of Safety Awareness of Science Teachers Using Interactive Videodisc Technology. *Science Education*, 79(5), 519-534.

The Safety Simulator provides yet another unique alternative to the troubled direct observation method. Interactive videodisc technology was used to assess science teachers' knowledge about lab safety. The Simulator evaluations proved to be easy to administer, efficient, cost effective and have good standardization. The article discusses problems with direct observation.

Poirot, James L. (1992). Assessment and Evaluation of Technology in Education: Teacher as Researcher. *Computing Teacher*, v20(1), 9-10.

The author gives his views about the state of assessment and evaluation and offers some suggestions for improvement. He emphasizes the importance of adequate planning, of examining student gains, and of analyzing *teachers'* needs and attitudes.

III. Examples of instrumentation for observing different types of variables

Baker, Eva L., Herman, Joan L.(1988). *Implementing STAR: Sensible Technology Assessment Research* (Rep. 285). Los Angeles: University of California, Center for the Study of Evaluation.

This report for evaluating the Apple Classroom of Tomorrow presents the STAR model for implementation. The authors provide a Phase I discussion of how the evaluation team will go about getting started. The model is guided by these questions: what effects will ACOT have on students, on teachers, and what are other possible effects? A set of measures for various activities (such as student writing and problem solving) is provided.

Fowler, Floyd J., Jr. (1993). Survey Research Methods (2nd Edition). Newbury Park, CA: Sage.

Using non-technical language, the author has provided a comprehensive discussion of survey design (including sampling, data collection methods, and the design of survey questions) and procedures which constitute good survey practice, including attention to data quality and ethical issues. According to the author, "this book is intended to provide perspective and understanding to those who would be designers or users of survey research, at the same time as it provides a sound first step for those who actually may go about collecting data." *

Gearhart, M., Herman, J.L., Baker, E.L., & Novak, J. (1992). *A new mirror for the classroom: A technology-based tool for documenting the impact of technology on instruction* (Tech. Rep. No.336). Los Angeles: University of California, Center for the Study of Evaluation.

This report was presented to the Apple Classroom of Tomorrow. It describes an observation instrument for documenting the impact of technology on classroom instruction and provides criteria for the coding of certain activities. The authors also provide examples of indicators: do teachers' roles shift when technology is in use, does technology have an impact on students' responses to instruction, etc. Gives examples of their expectations and their results.

Herman, Joan L., Winters, L. (1992).*Tracking Your School's Success* (Chapter 5). Newbury Park, CA: Sage.

This general guide to evaluation includes a useful chapter on analyzing information. It provides help with organizing data and answering needs assessment questions. The chapter also provides a guide to assist with answering formative evaluation questions.

IV. Examples of measurement issues

Campbell, Donald T. & Stanley, Julian C. (1966). ***Experimental and Quasi-experimental Designs for Research.*** **Boston, MA: Houghton Mifflin.**

This slim volume is a slightly enlarged version of the chapter originally published in the 1963 Handbook of Research on Teaching and is considered the classic text on valid experimental and quasi-experimental designs in real world situations where the experimenter has very limited control over the environment. To this day. it is the most useful basic reference book for evaluators who plan the use of such designs. *

Guba, E.G. & Lincoln, Y.S. (1989). ***Fourth Generation Evaluation.*** **Newbury Park, CA: Sage.**

The authors propose a monumental shift in evaluation practice, advocating the constructivist position in its most extreme form. Guba and Lincoln describe problems faced by previous generations of evaluators--politics, ethical dilemmas, imperfections and gaps, inclusive deductions--and lay the blame for failure and non utilization at the feet of the unquestioned reliance on the scientific/positivist paradigm of research. Fourth generation evaluation moves beyond science to include the myriad human, political, social, cultural, and contextual elements that are involved in the evaluation process. This book describes the differences between the earlier (and still widely used) evaluation model, based on positivist/scientific assumptions and statistical techniques, and the naturalistic approach to evaluation, and outlines methodological guidelines for the conduct of naturalistic evaluations. *

Jaeger, R.M. (1990). Statistics: ***A Spectator Sport*** **(2nd Edition). Newbury Park, CA: Sage.**

This book takes the reader to the point of understanding advanced statistics without introducing complex formulas or equations. It covers most of the statistical concepts and techniques which evaluators commonly use in the design and analysis of evaluation studies, and most of most of the examples and illustrations are from the field of education. The topics included range from descriptive statistics, including measures of central tendency and fundamentals of measurement, to inferential statistics and advanced analytic methods.*

Stewart, David W. & Shamdasani, Prem N. (1990). ***Focus Groups: Theory and Practice.*** **Newbury Park, CA: Sage.**

This volume pays considerable attention to the fact that focus groups are by definition an exercise in group dynamics, which must be taken into account when conducting such groups and especially when interpreting the results obtained. It also covers practical issues like recruitment of participants, the role of the moderator, and appropriate techniques for data analysis.*

Yin, Robert K. (1989). Case Study Research: Design and Method. Newbury Park, CA: Sage.

While arguing eloquently that case studies are an important tool when an investigator (or evaluator) has little control over events and when the focus is on a contemporary phenomenon within some real life context, the author insists that case-studies be designed and analyzed so as to provide generalizable findings. Although the focus is on design and analysis, data collection and report writing are also covered. *

*These references were taken from :

Stevens, F., Lawrenz, F., Sharp, L. (1993). User-Friendly Handbook for Project Evaluation: Science, Mathematics, Engineering and Technology Education (Chapter 8). Alexandria: National Science Foundation.

V. Web Sites

The Center for Teaching and Learning Support
http://www.hull.ac.uk

British home page which provides a link to the European scene. It also has a subheading which provides international education/technology Internet listings. Includes a distance learning page and a "computer assisted assessment" which enables you to generate an assessment exercise.

Instructional Technology Resources
http://interact.uoregon.edu

Listings of various associations connected with education and technology, discusses EdTech research, and has an on-line resource center. Topics under "research" heading include Edweb and the K-12 Internet Testbed, a site where you can learn more about education policy and reform.

Technology Education Resources
http://ed1.eng.ohio-state.edu/TechEdRes.html

This site provides seven categories of valuable resources: Journals and Magazines, Vendors, Professional Organizations (Apple, Microsoft), Content Resources(MIT; NASA Spacelink), Gophers, LISTERVs (technology groups that you can subscribe to), and Newsgroups. Each entry has numerous selections. Technology Education Resources is a one stop shop for basic information needs.

Technology for the Classroom
http://tiger.coe.missouri.edu/tech.html

Includes headings for different journals, innovative academic uses for the Internet, and Scholastic's electronic learning. Site is oriented toward teachers who are looking for resources for their classrooms.

World Wide Web Virtual Library: Educational Technology
http://tecfa.unige.ch/info-edu-comp.html
This site has a separate page discussing educational software and lists current technology-related research projects.

C. LIST OF CONTACTS

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TECHNOLOOGY LEARNING CHALLENGE GRANTS

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D. SAMPLES OF PLANNING AND DATA COLLECTION INSTRUMENTS

The section provides examples of planning and data collection instruments that might be useful models for your progress assessment. Primary sources and authors are listed for each; for further information about particular instruments, please contact the authors or RAND staff.

LIST OF INSTRUMENTS

- Assessing Needs and Setting Goals
- Implementation Plan and Benchmarks
- Teacher Survey
- Teacher Survey
- Principal Interview Guide
- Parent Survey
- Student Survey
- Progress Rubric
- Progress Benchmarks
- Implementation Observables Checklist
- Context Data Worksheet
- Comprehensive Outcomes Worksheet

Assessing Needs and Setting Goals

From the San Mateo Challenge Grant proposal, 1995

SYSTEMATIC AND SYSTEMIC SHIFTS

All of the proposed systemic and systematic changes outlined below

are driven by the overarching goal of providing an educational program

which maximizes the unique talents, skills, and needs

of each child and his/her

family system.

	WHERE WE ARE NOW	**WHERE WE NEED TO BE**
1	• Student enters into and moves through system organized by age/grade, segmented into discrete units and varying geographical locations • Limited information available about the child, family, and learning needs • No clearly identified support system that ensures that student is succeeding throughout educational career • Limited support for families during student's K-12 experience	• At any time or age that a student enters BVLC system, the student is assessed using Student Learning Profile (*) • Systems in place which allow for on-going reassessment of who the student is becoming and what human and educational resources will ensure continued success • Unified organizational structure which allows for student progress through a seamless learning environment where instruction supports learning • Established strong support systems for families
2	• Fuzzy awareness of what 'bottom line' is in the educational process • Use of unrelated, state developed criteria to assess student performance • Student often has little responsibility in assessment process	• Established rubrics of world class performance standards which clearly relate to ongoing instruction • Consistent performance standards across Consortium • Variety of authentic assessment measures based on real life situations • Assessment occurs at various levels of mastery throughout the student's educational program • Student assumes active role in self-assessment and goal setting

3	• Technology limited and outdated
	• Often students more proficient than teachers
	• Communication limited among students, homes, teachers, administrators, other schools, business/industry, and the world at large
		• State of the art technology, incorporating voice and electronic modalities and ongoing training and maintenance to support it
		• All Consortium members proficient in the use of technology so that:
		  • collaborative communication among all members of Consortium can occur easily
		  • all students have access to information and resources now only available at libraries and resource centers
		  • all students retain lifelong learning opportunities
		  • all members may engage in distance learning opportunities

(*) See glossary

To accomplish our vision we have identified 19 areas which target instructional reform through systematic and systemic change. These focus on both the students and adults within the learning community. Included are:

- World class benchmarks and standards
- State of the art technology
- Professional development and interprofessional relationships
- Re-engineered human and financial resources
- Strengthened family, business, and community partnerships within and across the Consortium

HOW WE WILL GET THERE	**RESOURCES WE NEED**
• Develop intake system which screens student and family in Pre-Placement Class (*) where interests, talents, skills, and needs are evaluated • Develop on-going assessment systems (support and progress) to ensure student is meeting Learning Profile goals • Restructure the consortium into K-12 Learning Families (*) and Child Advocate Teams (*) • Assign student to Child Advocate Team and Learning Family within Consortium. This family will support student throughout educational career • Expand and develop parent support/education • Develop Decision Tree project (*), and other medical and allied medical connections within BVLC • Build an electronic network that facilitates communication, promotes learning, and accesses resources	• Time to create in-take and on-going assessment systems • Time to restructure into Learning Families and Child Advocate Teams • Time and resources to implement Decision Tree project across Consortium • Time to develop other medical collaboratives • Electronic tools and training to use them • Time to plan, expand, and develop support programs for Consortium families and community
• Develop benchmark standards and performance rubrics through collaboration with business and community • Develop Student Learning Profile which includes rubric information • Develop assessment tools that include real and simulated life application • Develop Student Advocate systems which continuously monitor individual student progress • Provide training for learning facilitators and students which focuses on student centered assessment (including individual rubrics, goal setting, short term objectives, and criteria for success)	• Time to develop benchmark world class standards across Consortium • Time to develop Student Learning Profile • Time to develop structure for Student Advocate Teams across Consortium • Electronic communication to facilitate involvement of Consortium members in development of assessment tools • Time to train learning facilitators and students in student centered self-assessment strategies
• All students, learning facilitators, parents, Community Members (*) have access to, and are trained in the use of state of the art computer/electronic technology • Provide access to electronic resources for all community members. • Include in instructional day time for community members to communicate both in person and electronically Begin staff/community program that teaches about the value of collaborative communication • Train all students to access world-wide information through electronic tools	• Fiber-optic network linking all ten consortium sites with one another and the world • Several state of the art workstations in each classroom • Electronic notebooks for learning facilitators • Technology training for all community members • Support for ongoing maintenance and hardware upgrade, soft-ware, network • Appropriate software • Professional development time

	WHERE WE ARE NOW	**WHERE WE NEED TO BE**
4	• Language arts and other curricula taught as separate subjects using traditional information assimilation (lecture type) formats	• Language Arts and other curricula become integrated around authentic problems with well defined tool/application performance standards. These performance standards include academic, personal, interpersonal growth and breadth of human intelligences. • Access to electronic communication to connect students with the resources in the world.
5	• Student/teacher ratios as high as 36 to 1 • Teacher as director of instruction	• The concept of "teacher" expanded to include parents, industry, professional and business personnel, as well as other elementary secondary, and post secondary students • Apprenticeships and mentorships as viable options • Teacher as "learning facilitator"
6	• Curriculum that is not continuous across subject, grade, schools, and time and often unrelated to real life needs	• Instruction that teaches tools and their application in uninterrupted, flexible time frames, using thematic integration • Instruction that is continuous and built upon previous learning is emphasized across consortium • Students demonstrate mastery as designated by the benchmark rubric before progressing
7	• Student personal and interpersonal development not given aggressive instructional emphasis	• Ethical standards and interpersonal skills as an integral part of the curriculum
8	• Educators struggling to meet the diverse needs of ALL learners because of difficulty teaching to the myriad of student differences • Students categorically placed which separate opportunities, materials, manpower, and funds • Home support often limited	• ALL learners offered equal access to, and included in learning situations that honor their learning styles, talents, needs, and potentials • Parents educated to become partners
9	• Lack of understanding across ethic/racial groups • Isolated multicultural experiences, mandated by districts, not infused into general curriculum • Few instructors proficient in first/second language acquisition	• Multicultural approach to learning which incorporates cultural diversity into subjects such as social studies, art, music, history, and literature • Building of acceptance of multiple perceptions • Instruction and curriculum which emphasizes inclusion of all kinds of differences: gender, race, ethnicity, class, physical ability, religion, and learning ability

(*) See glossary

HOW WE WILL GET THERE	RESOURCES WE NEED
• Work with business, community partners to establish benchmark performance standards for communication skills. • Create creative problem solving instructional formats which integrate standards across curriculum. • Continuously improve standards and instruction assessment with real world.	• Time for reengineering standards of instruction and assessment • Two way business/community internships to integrate real world experiences/expectations
• Designate credentialed instructor to facilitate training of community resource personnel permitting them to guide learning in areas of expertise for groups of individual students • Establish partnerships with businesses whose employees will act as role models and mentors for children	• Business leaders who will work with assigned Consortium members to develop career exposure opportunities for students • Members of the extended community to volunteer time and expertise at school and job sites
• Identify planning teams within curriculum areas and across schools within Consortium • Restructure use of [illegible] in [illegible] and role of instructor • Use Learning Profile rubric and Learning Family Team • Develop communication system within and across all areas of Consortium	• Adequate team planning time • Electronic communication across Consortium • Outside consultants in areas of expertise
• Integrate interpersonal [illegible] throughout the curriculum • Use simulations and real-life immersion experiences to empower children in areas of ethical and interpersonal development • Engage students/staff in ongoing boundary breaking activities that teach risk-taking and build inner strength and problem solving skills	• Staff development programs • Consultation with other Consortium member institutions who have have already developed curriculum techniques and strategies to share • "Outward Bound" immersion programs • Mentor role models from the community
• Initiate ongoing teacher training in [illegible] instruction and experiential education • Train learning facilitators to recognize atypical development and know when, how, and where to refer for help • Develop experience-based educational programs which maximize each student's potential. • Share and expand upon already available curriculum and instructional materials across Consortium • Expand dialog with SJSU professional preparation programs to discuss how best to prepare educators to meet diverse needs of all students • Identify "lab" sites within Consortium where preservice and in-service teachers can benefit from outstanding models of learning facilitator practices. • Create linkage between current district professional support programs and SJSU professional preparation program, so that professional development is on a seamless continuum from beginning preparation to retirement	• Professional development programs that make use of members expertise across Consortium • Training for all educators in Decision Tree Program* • Expand SJSU university program involvement to include secondary teacher and administrator preparation as well as the Concurrent Multiple Subject/Learning Handicaps Credential program, (already involved)
• Team planning to integrate curriculum areas that promote opportunity for transfer of information to real life and build personal connection between the student and real life, emphasizing global issues and complexity. • Immersion activities emphasizing cross-cultural experiences	• Internet access • Community immersion resources • Conflict resolution training • Peer counseling programs

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	WHERE WE ARE NOW	WHERE WE NEED TO BE
10	• Extremely limited medical and allied medical/educational collaboration to meet student needs	• Promotion of ongoing medical and allied medical collaboration • Educators have easy, on-going access to medical and allied medical community for consultation
11	• Superficial coordination of home, community, other schools, and university resources	• Deeply interwoven network of home, community, business, and educational facilities that allow the student, family and community to use a variety of resources
12	• Teacher assessment currently limited to review and evaluation by site administrator	• Learning facilitators' assessment expanded to include active participation in their own evaluations • Goals for professional growth and evaluation of the goals set collaboratively
13	• Education occurring with little regard for what is needed to succeed in today's business world	• Education working in partnership with business to assure that students are competent, trained workers when they complete their "formal" schooling years
14	• Compensation based upon tenure and years of service	• Expand ways in which teachers can be remunerated and supported
15	• Limited opportunity for teachers to assume other roles within the educational setting	• Expansion of potential roles and responsibilities for teachers within the Consortium
16	• Teachers, within and across schools, working as independent agents with varying degrees of support by those who administer them	• Teachers and administrators across the consortium working as one team using participatory management strategies • Sharing and supporting of common goals across Consortium • Assuring each student supported by entire system as she/he moves around within it
17	• Limited standardization of program evaluation and correction of system problems across district • Program assessment typically done school by school, district by district • No relationship between school program evaluation and university teacher preparation	• Program assessment across Consortium using state of the art quality control methods to identify and correct problems in the system as they emerge

(*) See glossary

HOW WE WILL GET THERE	**RESOURCES WE NEED**
• Provide professional development in understanding importance of medical - educational connection • Provide training in use of Decision Tree Model for collaborative consultation across medical/allied medical and educational personnel • Develop systems for increased collaboration among educational and medical/allied medical professionals	• Consultation and training among Consortium members and medical/allied medical personnel • Decision Tree Program • Electronic communication across Consortium
• Develop a database of material and human resources • Create a system to access resources across Consortium	• Team building time across Consortium • Time for and assistance with database development • Time to develop resource access system
• Initiate learning facilitator self-assessment process for all members of the Consortium including university • Members of the Consortium work together to develop a uniform process for professional development and review that is based on student performance related to benchmark standards • Experience based professional development programs throughout the consortium with participation of concurrent credential teacher trainees and professors	• Planning time for Consortium to develop the uniform process
• Partnerships between business and the Consortium in which we: 1. Make evaluations regarding what business requires from students in order for them to be effective workers 2. Do long-range planning to make sure that education and business are aligned with respect to future needs 3. Cooperate with business to assist in training, facilitating current population of employees	• Designated business and educators to work together
• Establish committee to begin process of communication and mutual understanding between union leaders and union members within Consortium	• Team of representatives using industry expertise and advice
• Learning facilitators (including university professors) serve within the Consortium in different capacities,(i. e. adjunct professor, full time teacher advisor to beginning learning facilitators, coordinator of experiential learning programs, business liaison, parent support coordinator, child advocate, etc.)	• Time to develop the roles, responsibilities, ways, and means for new educator roles
• Build learning families across Consortium that will establish meeting times for short and long term planning, reflection and assessment of there work	• Time for learning families to develop flexible schedules ongoing planning time
• Identify process that identifies strengths and weaknesses across Consortium and permits dissemination of resources	• Development and implementation time for system wide process evaluation • Industry consultant for assistance with quality control development

	WHERE WE ARE NOW	**WHERE WE NEED TO BE**
18	• Funding allocated to districts by average daily attendance • Categorical funds limited and designated for special programs and populations to be served, e.g. Special Education, Gifted education • Individual schools compete for funds, often for overlapping programs	• Funding based upon a system that shares resources and directs funds where needed within the Consortium
19	• Limited two-way communication between California Department of Education and schools in the community	• Ongoing two-way communication system that allows state and local districts to inform each other so that they can better work together to solve identified problems

MANAGEMENT

Adapting the same model used to develop this proposal, The Blossom Valley Learning Consortium will be directed by a **Consortium Council**. The Council of **24 members** will be elected by their peers for staggered two year terms.

Policy/decision makers will include:

- 1 representative from each member educational institution
- 1 representative from each of four governing bodies
- 6 representatives from industry/community partnerships
- 4 student representatives

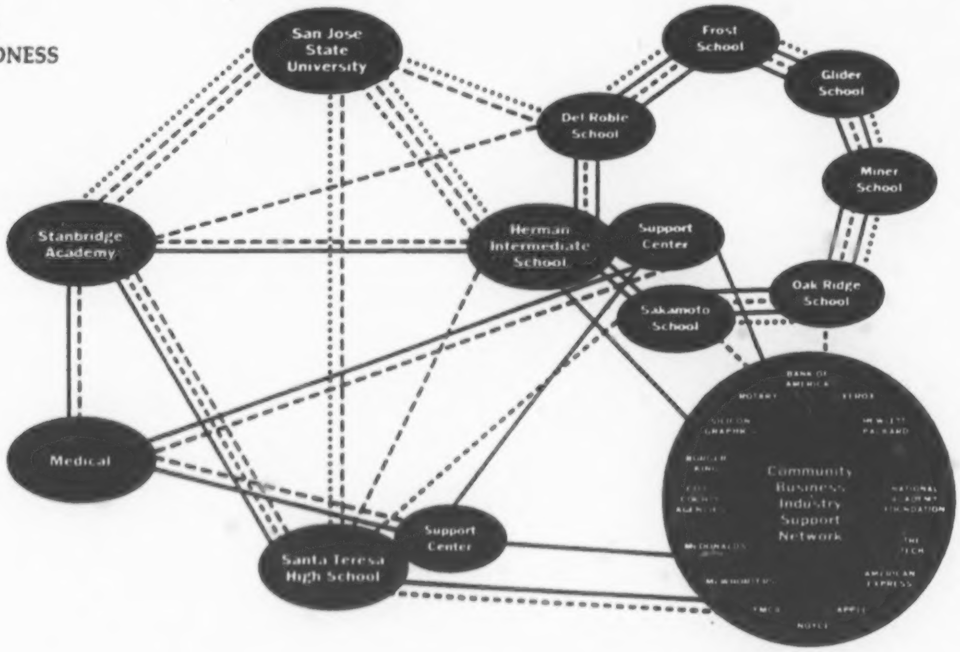
The Council will appoint a 5 member Steering Committee from its membership to administer the program and attend to day-to-day program operation.

The Consortium Council will have the following major responsibilities:

1) Establish time line for implementation of changes
2) Ensure that expected outcomes are achieved through the educational programs.
3) Provide for the health, safety and well being of students and staff
4) Develop and maintain working relationships with parent organizations
5) Consider allocation of resources, prepare and submit proposed budgets, provide incentives for success
6) Provide timely information to constituencies (public relations and annual reports, newsletters and videos)
7) Conduct quarterly progress meetings open to staff and constituents
8) Ensure systems changes, seek waivers, reinvent relationships
9) Evaluate progress and maintain continuous improvement process
10) Develop and implement a business plan built around measurable outcomes
11) Establish and sustain a vital research and development component
12) Develop a system for fiscal and resources management
13) Establish a plan for human resources management

HOW WE WILL GET THERE	**RESOURCES WE NEED**
• Vehicle established to develop a pool of additional sources of funds that can support the goals of the BVLC	• Designated partnership of educational and business to explore and recommend additional grants, foundations and other sources of funding to ensure the completion of the BVLC goals and to sustain these efforts for long term
• Open lines of communication that promote mutual understanding and support • Establish a team of "ambassadors" made up of business leaders and Consortium members working with key legislators and the California Department of Education	• Team of "ambassadors" (business leaders and Consortium members)

RESOURCE INTERCONNECTEDNESS


San Jose State University
Frost School
Glider School
Del Roble School
Miner School
Stanbridge Academy
Herman Intermediate School
Support Center
Oak Ridge School
Sakamoto School
Medical
Support Center
Santa Teresa High School
Community Business Industry Support Network
BANK OF AMERICA
ROTARY
XEROX
SILICON GRAPHICS
HEWLETT PACKARD
BURGER KING
COUNTY AGENCIES
NATIONAL ACADEMY FOUNDATION
MCDONALDS
THE TECH
AMERICAN EXPRESS
YMCA
APPLE
- - - - - - Computer Network
———— Medical Network
- - - - - - Transportation Network
———— Community/Support Network
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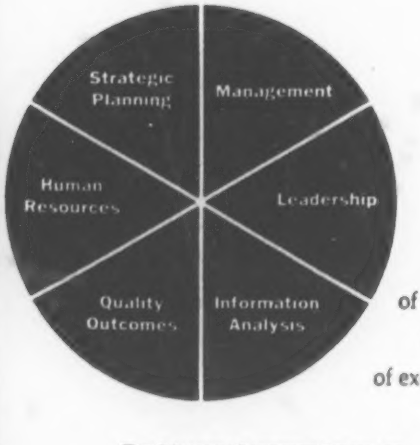
Strategic Planning
Management
Human Resources
Leadership
Quality Outcomes
Information Analysis

The vision also includes bold new systems for "managing the process", ensuring long term excellence, and sustaining continuous improvement. We are pursuing implementation of the Malcolm Baldrige Template application. Here, too, we pursue benchmark standards of excellence to assure the quality of our process.

THE MALCOM BALDRIGE TEMPLATE
FOR EDUCATIONAL TOTAL QUALITY PROCESS

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EVALUATION

Evaluation of these plans to reinvent education will be tough, thoughtful and directed. The evaluation will be based on achievement of simple, rigorous, profound objectives established on a yearly basis and included in a Consortium Plan. The Consortium Plan will be established and published each April. It will be prepared by the Consortium Council with industry/community involvement.

Objectives will include the following categories:

1) Achievement of rigorous, measurable student objectives with special emphasis on Language Arts achievement
2) Communication through technology (tools of the day) as it affects student achievement and staff performance
4) Support services (tutoring services, alternative learning environments, medical diagnoses, social services, family/community partnerships)
5) Professional staff development
6) Governance process
7) Quality assurance (Malcolm Baldrige)
8) Business/community/agency partnerships
9) Systems Reengineering
10) Refining existing rules, regulations and organizational structures which currently govern education
11) Inclusion/involvement of constituent groups

Implementation Plan and Benchmarks

From the Modern Red Schoolhouse school design, Hudson Institute, 1995

Chart 4
Sample MRSh Technology Implementation Timeline

	Years 1 - 2	Years 3 - 4	Year 5
School-based Planning/ Oversight	School-based technology committee formed; teacher usage, equipment inventory, and implementation plan developed	Committee monitors installation, training, and usage	Committee monitors installation, training, and usage
"Classroom" Equipment	Install LAN including data, voice & video cabling, file server(s), operating software, and network modems/supporting phone lines	Maintain LAN	Maintain LAN
	100 percent of classrooms receive teacher-based multi-media computer with presentation monitor and printer	Acquire additional computers as necessary	Acquire additional computers as necessary
	40 percent of classrooms/subject areas receive student computers equaling 1:6 student ratio	80 percent of classroom/subject areas receive student computers (1:6 ratio)	100 percent of classroom/subject areas receive student computers (1:6 ratio)
	Acquire peripheral supports (e.g., video cameras, scanners, laserdisc players to equal 1:10 teacher ratio	Acquire additional peripheral supports to equal 1:7 teacher ratio	Acquire additional peripheral supports to equal 1:4 teacher ratio
	Additional phones acquired (equaling 1:10 teacher ratio)	Additional phones acquired (equaling 1:5 teacher ratio)	Additional phones acquired (equaling 1:1 teacher ratio)
Other Equipment	Administrative/office equipment (e.g., fax, laser printer)	Media center collections placed on LAN	General access lab(s) equipped/upgraded and hooked onto LAN
		Satellite and cable connections and equipment installed	Acquire in-house video production equipment
	Establish maintenance contracts or other in-district support	On-going maintenance contracts/support	On-going maintenance contracts/support
Software	Acquire software: IMS, MIS, e-mail, integrated productivity tools, and instructional packages	On-going software review and acquisition	On-going software review and acquisition
Training/ Support	Identify funds to hire school-based technology coordinator/trainer	Continue/expand school-based coordinator	Continue/expand school-based coordinator
	Provide for initial "basic" training for all school personnel	On-going basic and advanced training	On-going basic and advanced training

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Teacher Survey

From the Modern Red Schoolhouse school design, Hudson Institute, 1995

Modern Red Schoolhouse
Teacher Survey
1995

Instructions

This is a survey for teachers participating in the Modern Red Schoolhouse initiative. It is intended to help us gauge the degree to which you think you understand various elements of the design and the degree to which you think the design has affected student behavior and learning. We realize that, for instance, with changes in student learning, it is hard to know exactly which program elements are having the biggest effect on students. Your best judgment is all that we can ask.

Keep in mind that your honest assessment will be the most helpful to our work. Knowing the strengths and weaknesses of any effort can only make it better. Your comments will be kept strictly confidential. All reporting within Hudson will be done only at a school level. Results distributed to the public will not identify the name of any school with any responses from this survey.

Please read through the instructions below and then proceed to answer the questions in a way that best describes your response to each question.

1. **Write your name on the cover sheet and detach it. Your site coordinator will collect it prior to the time you begin the survey.**

2. **Please complete the survey during one sitting if possible. We estimate that it will take approximately a half hour.**

3. **All of the questions require one response only. Please select only one of the many response choices given.**

4. **When you have completed the survey, please return it to your site coordinator by no later than Thursday, March 9th.**

We indeed thank you for your assistance and cooperation!

TEACHER SURVEY

Please indicate your responses by marking your answers directly on this questionnaire.

Project Effectiveness

Please provide your best estimate of how the Modern Red Schoolhouse design has improved your school in the following areas: (Circle either "3, 2 or 1").

		A lot	**Some**	**None**
1.	Teachers use of technology in their classrooms	3	2	1
2.	Teachers' roles in making school decisions	3	2	1
3.	School autonomy	3	2	1
4.	Leadership skills	3	2	1
5.	Parent involvement	3	2	1
6.	Community involvement	3	2	1
7.	Students' engagement with learning	3	2	1
8.	Achievement levels of all students	3	2	1

*Please indicate **how well you understand** each of the following Modern Red Schoolhouse concepts, very well, well, somewhat, or not well. (Circle the number that best describes your judgment of how well you understand each concept.)*

		5 = Very well	*4 = Well*	*3 = Somewhat*	*2 = Not well*	*1 = Does not apply to my school.*
9.	MRSH standards	5	4	3	2	1
10.	Core Knowledge curriculum.	5	4	3	2	1
11.	Work force skills	5	4	3	2	1
12.	Character development through establishing core virtues with community.	5	4	3	2	1
13.	School autonomy	5	4	3	2	1
14.	Developing a staffing structure that matches needs of students	5	4	3	2	1
15.	Continuous progress to all students	5	4	3	2	1
16.	The Individual Education Compact (IEC)	5	4	3	2	1
17.	Technology and information networks	5	4	3	2	1
18.	Primary, Intermediate, and Upper divisions	5	4	3	2	1
19.	Parental choice	5	4	3	2	1
20.	Hudson Units	5	4	3	2	1
21.	Watershed assessments	5	4	3	2	1
22.	Student Reports	5	4	3	2	1
23.	School Reports	5	4	3	2	1
24.	Pre-school consortium	5	4	3	2	1
25.	Parent involvement	5	4	3	2	1
26.	Parental Information Centers	5	4	3	2	1
27.	Community support services for students	5	4	3	2	1

Please indicate the extent to which each of the following Modern Red Schoolhouse concepts is observable at your school. (Circle the number that best describes the level at which each listed concept is in place at your school.)

5 = implemented fully
4 = implemented to a large degree
3 = implemented to a moderate degree
2 = minimally implemented
1 = has not been implemented

		5 = fully.	*4 = to a large degree*	*3 = moderate degree*	*2 = minimally*	*1 = not implemented*
28.	MRSH standards	5	4	3	2	1
29.	Core Knowledge curriculum	5	4	3	2	1
30.	Work force skills	5	4	3	2	1
31.	Character development	5	4	3	2	1
32.	School autonomy	5	4	3	2	1
33.	A staffing structure that matches needs of students	5	4	3	2	1
34.	Continuous progress to all students	5	4	3	2	1
35.	The Individual Education Compact (IEC).	5	4	3	2	1
36.	Performance grouping	5	4	3	2	1
37.	Multi-age homerooms	5	4	3	2	1
38.	Technology and information networks	5	4	3	2	1
39.	Primary, Intermediate, and Upper divisions	5	4	3	2	1
40.	Parental choice to attend this school	5	4	3	2	1
41.	Hudson Units	5	4	3	2	1
42.	Watershed assessments	5	4	3	2	1
43.	Student Reports	5	4	3	2	1
44.	School Reports	5	4	3	2	1
45.	Pre-school consortium	5	4	3	2	1
46.	Parent involvement	5	4	3	2	1
47.	Parental Information Centers	5	4	3	2	1
48.	Community support services for students	5	4	3	2	1

Please provide your best estimate of the degree to which the academic achievement of your students has been improved by these Modern Red Schoolhouse elements.

5 = Very Positive effects.
4 = Some Positive effects.
3 = No effects.
2 = Some Negative effects.
1 = Very Negative effects.
0 = Not implemented at this time

		5 = Very Positive effects.	*4 = Some Positive effects.*	*3 = No effects.*	*2 = Some Negative effects.*	*1 = Very Negative effects.*	*0 = Not implemented.*
49.	MRSH standards	5	4	3	2	1	0
50.	Core Knowledge curriculum	5	4	3	2	1	0
51.	Work force skills	5	4	3	2	1	0
52.	Character development	5	4	3	2	1	0
53.	School autonomy	5	4	3	2	1	0
54.	A staffing structure that matches needs of students	5	4	3	2	1	0
55.	Continuous progress to all students	5	4	3	2	1	0
56.	The Individual Education Compact (IEC).	5	4	3	2	1	0
57.	Performance grouping	5	4	3	2	1	0
58.	Multi-age homerooms	5	4	3	2	1	0
59.	Technology and information networks	5	4	3	2	1	0
60.	Primary, Intermediate, and Upper divisions	5	4	3	2	1	0
61.	Parental choice to attend this school	5	4	3	2	1	0
62.	Hudson Units	5	4	3	2	1	0
63.	Watershed assessments	5	4	3	2	1	0
64.	Student Reports	5	4	3	2	1	0
65.	School Reports	5	4	3	2	1	0
66.	Pre-school consortium	5	4	3	2	1	0
67.	Parent involvement	5	4	3	2	1	0
68.	Parental Information Centers	5	4	3	2	1	0
69.	Community support services for students	5	4	3	2	1	0

How often do some students demonstrate the following behaviors in your classroom: ***everyday, several times a week, several times a month, or never?***

		3 = Everyday	*2 = Several times a week*	*1 = Several times a month*	*0 = Never*
70.	Students bring items from home which support school studies	3	2	1	0
71.	Students finish work and have nothing to do	3	2	1	0
72.	Students work in small groups to solve complex problems	3	2	1	0
73.	Students talk about what they learn in class outside of the classroom	3	2	1	0
74.	Students are frustrated and confused over assignments	3	2	1	0
75.	Students complete work and don't know what to do next	3	2	1	0

About how often do some students in your classroom do the following: everyday, once or twice a week, once a month, hardly ever, or never?

		5 = Every day	4 = Once or twice a week	3 = Once a month	2 = Hardly ever	1 = Never
76.	help other students having difficulity with an assignment	5	4	3	2	1
77.	work in performance level groups	5	4	3	2	1
78.	skip class	5	4	3	2	1
79.	misbehave and disrupt others from learning	5	4	3	2	1
80.	work one-on-one with you	5	4	3	2	1
81.	work with another student having a different skill-level in a particular subject	5	4	3	2	1
82.	work alone	5	4	3	2	1
83.	read books that are not assigned	5	4	3	2	1
84.	obtain assistance from an adult volunteer or other staff member	5	4	3	2	1
85.	decide how to present what it is they have learned.	5	4	3	2	1
86.	use computers to support academic activities.	5	4	3	2	1
87.	use the school library to find resources for projects.	5	4	3	2	1

School Climate

Following are a number of statements that might be made about your school. Please indicate your level of agreement with the statement by circling a number between 5 (Strongly agree) and 1 (Strongly disagree) on the scale located to the right.

		Strongly Agree				**Strongly Disagree**
88.	The school has a written mission statement that is shared by all stakeholders.	5	4	3	2	1
89.	This school's mission statement makes direct reference to teaching and learning for all.	5	4	3	2	1
90.	What must be learned, and who is accountable, is clear at this school.	5	4	3	2	1
91.	The climate of the school reflects the belief that all students can succeed.	5	4	3	2	1
92.	School goals and objectives are clearly stated in a way that provides direction	5	4	3	2	1
93.	School goals and objectives are achievable.	5	4	3	2	1
94.	School goals and objectives are translated into action plans by staff.	5	4	3	2	1
95.	At this school we are trying to build a community of shared values and beliefs.	5	4	3	2	1
96.	This school fosters a sense of ownership and leadership among staff by involving them in decisions about the school and school programs.	5	4	3	2	1
97.	I am satisfied with the level and nature of my involvement in decision-making.	5	4	3	2	1
98.	In this school I am encouraged to experiment with my teaching.	5	4	3	2	1

Following are a number of statements that might be made about your school. Please indicate your level of agreement with the statement by circling a number between 5 (Strongly agree) and 1 (Strongly disagree) on the scale located to the right.

		Strongly Agree				**Strongly Disagree**
99.	Teachers at this school have high expectations for their own performance.	5	4	3	2	1
100.	At this school there are a broad array of teaching strategies being implemented.	5	4	3	2	1
101.	Staff morale is high—administrators, teachers, and other school staff exhibit pride in the school.	5	4	3	2	1
102.	Student morale is high—students exhibit pride in the school.	5	4	3	2	1
103.	We have the tools to appropriately monitor student progress at this school.	5	4	3	2	1
104.	Student progress is best measured through the use of norm-referenced tests.	5	4	3	2	1
105.	Results of measurements of student progress are appropriately used to improve individual student performance and guide instruction.	5	4	3	2	1
106.	This school has good alignment between the written, taught and tested curriculum.	5	4	3	2	1
107.	This school is making good use of technology by both teachers and students to monitor learning progress.	5	4	3	2	1
108.	This school is making an appropriate move toward more authentic forms of assessment.	5	4	3	2	1

Following are a number of statements that might be made about your school. Please indicate your level of agreement with the statement by circling a number between 5 (Strongly agree) and 1 (Strongly disagree) on the scale located to the right.

		Strongly Agree				**Strongly Disagree**
109.	The atmosphere of this school is professional.	5	4	3	2	1
110.	The environment of this school is conducive to learning.	5	4	3	2	1
111.	Students at this school work well together.	5	4	3	2	1
112.	Teachers at this school express a good deal of collegiality among their peers.	5	4	3	2	1
113.	Leadership abilities are nurtured at this school for both teachers and students.	5	4	3	2	1
114.	School and classroom environments are safe for people and property.	5	4	3	2	1
115.	Staff accept and take responsibility for school rules and standards.	5	4	3	2	1
116.	Students accept and take responsibility for school rules and standards.	5	4	3	2	1
117.	I have a sense of satisfaction in my professional role and feel I have a positive impact on students.	5	4	3	2	1
118.	Staff members are recognized for a job well done.	5	4	3	2	1
119.	Parents understand and support the mission of this school.	5	4	3	2	1
120.	Parents volunteer as much as they need to at this school.	5	4	3	2	1

Following are a number of statements that might be made about your school. Please indicate your level of agreement with the statement by circling a number between 5 (Strongly agree) and 1 (Strongly disagree) on the scale located to the right.

		Strongly Agree				**Strongly Disagree**
121.	This school is working adequately on building authentic partnerships with parents on issues pertaining to school governance.	5	4	3	2	1
122.	This school is adequately working on building authentic partnerships with parents on issues pertaining to student learning.	5	4	3	2	1
123.	This school offers parents training in how to support their children's learning.	5	4	3	2	1

In comparing student behavior in your classroom this academic year with the previous year, what is your best estimate of the following:

124. Student attendance is:

☐ better ☐ worse ☐ the same

125. Student interest in learning is:

☐ better ☐ worse ☐ the same

126. Student misbehavior is:

☐ better ☐ worse ☐ the same

127. *In general, how would you now characterize your support of the Modern Red Schoolhouse program in your school? Please circle one response.*

Strong Support	Moderate Support	Slight Support	Slight Opposition	Moderate Opposition	Strong Opposition
6	5	4	3	2	1

Below are questions that are intended to gather information about teachers as a group. Please complete the following information about you. (Circle the letter that applies).

128. Sex: (A) Male (B) Female

129. **Ethnicity** (A) Caucasian (B) Latino (C) Native American
(D) Black (E) Asian (F) Other

130. **How many years including this one have you participated in the *Modern Red Schoolhouse* project?**

A. Since our school considered joining, 1992.
B. Fall, 1993.
C. Fall, 1994.
D. Other, please specify:________________________________

131. **Please indicate whether or not you participate in any state or district performance pay or incentive wage program.**

A. I do participate in a performance pay or incentive wage program.
The name of the program is: ____________________________.

B. I do not participate in a performance pay or incentive wage program.

132. **How many years of *full-time* teaching experience do you have?**

A. More than 20 years.

B. 15 - 19 years.

C. 10 - 14 years.

D. 5 - 9 years.

E. 1 - 4 years.

133. How many years have you taught bilingual/LEP/bicultural students (**including this year**)? ____________ years or,
☐ I have never taught bilingual/LEP/bicultural students.

Academic/Professional Background

134. What is the highest degree you have received?

(A) Bachelor's + teaching credential
(B) Bachelor's + some units beyond credential
(C) Master's
(D) Master's + units beyond
(E) Doctorate
(F) Other (specify)____________________

135. Please indicate your certification and the subjects, grade levels, and specialties for which you are qualified: (Check all that apply)

A. State Department of Education. Please name the states: ______________
____
____

B. National Board for Professional Teaching Standards. Please name the subjects: ____

C. Other, please specify):______________________________________
____

D. I am not certified by any legal entity as of the date of this survey.

136. Please indicate which teaching credentials you have and specify the content area of specialization. ***(Circle all that apply.)***

(A) General Elementary
(B) General Secondary
(C) Special Emergency
(D) Multiple Subject
(E) Single Subjects
(F) Bilingual
(G) Early Childhood
(H) Special Education
(I) Other: ________________________.

If you have any other comments about the positive or negative effects of the Modern Red Schoolhouse program in your school, please provide them in space provided below.

THANK YOU FOR YOUR COOPERATION IN COMPLETING THIS SURVEY.

Teacher Survey

From *Tracking Your School's Success*, Herman and Winters, 1993

From: Herman & Winters,
Tracking Your School's
Success

Resource B: Sample Teacher Survey

Please indicate your responses by checking, circling, or filling in the blanks.

1. **Sex:** [ ]M [ ]F

2. **Ethnicity** [ ] Caucasian [ ] Latino [ ] Native American
[ ] Black [ ] Asian [ ] Other__________

3. **How many years *including this one* have you participated in the project?** __________

Academic/Professional Background

4. **What is the highest degree you have received?**
   - [ ] Bachelor's + teaching credential
   - [ ] Bachelor's + units beyond credential
   - [ ] Master's
   - [ ] Master's + units beyond
   - [ ] Doctorate
   - [ ] Other (specify) ______________

5. **Please indicate which teaching credentials you have and specify the content area of specialization. (Check ALL that apply.)**
   - [ ] General Elementary
   - [ ] General Secondary
   - [ ] Special Emergency
   - [ ] Multiple Subject
   - [ ] Single Subjects
   - [ ] Bilingual
   - [ ] Other__________________

6. **How many years of teaching experience do you have?** ______**years**

7. **How many years have you taught bilingual/LEP/bicultural students (including this year)?** __________ **years**

8. **Please characterize your current class(es):**
   a. **Grade level:**_______
   b. **Language(s) of instruction: 1. Mostly Spanish 2. Mixed 3. Mostly English**
   c. **Subject:**______________________**(Junior High only)**

9. **How would you characterize your effectiveness in teaching language arts to your current students?**

Low				Extremely High
1	2	3	4	5

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Project Effectiveness

10. Please rate the effectiveness of the project in each of the following areas:

	Poor		Adequate		Very Effective	NA
a) Communication with team members	1	2	3	4	5	6
b) Communication across teams	1	2	3	4	5	6
c) Motivating teachers to use technology in their classrooms	1	2	3	4	5	6
d) Making technology available in classrooms	1	2	3	4	5	6
e) Involving teachers in project decision making	1	2	3	4	5	6
f) Project management and organization	1	2	3	4	5	6
g) Project leadership	1	2	3	4	5	6
h) Project in-services	1	2	3	4	5	6
i) Work-study sessions	1	2	3	4	5	6
j) Operation of your Tech Center	1	2	3	4	5	6
k) Overall effectiveness of the project	1	2	3	4	5	6

Training

11. How effectively do you feel you have been trained by the program in the following areas?

	Poor		Adequate		Very effective	NA
a) Curriculum development	1	2	3	4	5	6
b) Use of equipment	1	2	3	4	5	6
c) Use of software	1	2	3	4	5	6
d) Language arts instruction	1	2	3	4	5	6
e) Integrating technology and language arts	1	2	3	4	5	6
f) Using technology with language minority students to meet your bilingual program's goals	1	2	3	4	5	6

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12. How much follow-up and assistance has the project provided you in the following areas?

	None		Some		A Great Deal	NA
a) Use of technology in instruction	1	2	3	4	5	6
b) Planning and developing curriculum units and activities	1	2	3	4	5	6
c) Becoming familiar with and learning about technology	1	2	3	4	5	6
d) Training students in equipment usage	1	2	3	4	5	6
e) Integrating the use of technology with bilingual instruction	1	2	3	4	5	6

Use of Technology

13. Approximately how much has your class used the Tech Center this school year?
__________hours/week

14. On average, how much do you use technology as part of your regular classroom program (not including Tech Center time)? Please indicate which of these are permanently in your classroom:

		PERMANENTLY IN MY CLASSROOM
Video equipment	________hours/week	[ ]
Computer equipment	________hours/week	[ ]
Laser disc equipment	________hours/week	[ ]
Other:_____________	________hours/week	[ ]

15. a. On average, how many *hours a month* do you spend doing the following project-related activities?

______hours a) Participating in project meetings and in-services
______hours b) Planning/developing instructional activities/curriculum units
______hours c) Becoming familiar with technology on your own
______hours d) Helping students in the use of the equipment during nonclass time
______hours e) Other (specify) ______________________________

b. About what percentage of this time is unreimbursed, nonschool time? ______%

16. How many times this school year have you shared your products and ideas with others?
a. At conferences__________
b. With non-MTS colleagues__________
c. Informal presentations__________

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Effects of Project

17. To what extent has your involvement in the project affected your expectations for your students' achievement?

Greatly Lowered	Slightly Lowered	Has Not Affected	Slightly Increased	Greatly Increased
1	2	3	4	5

Please explain:

18. How much of a difference (if any) has participating in the project had on your students' school-related attitudes and behaviors?

	None		Some		A Great Deal
a) Increased liking of school	1	2	3	4	5
b) Improved language arts skills	1	2	3	4	5
c) Improved confidence as a learner	1	2	3	4	5
d) Increased interest in technology	1	2	3	4	5
e) Improved student-teacher rapport	1	2	3	4	5
f) Increased participation in class	1	2	3	4	5
g) Improved student-student cooperation		1	2	3	45
h) Other (specify below):	1	2	3	4	5

19. Please rate the extent to which your involvement with the project has affected the following:

	None		Some		A Great Deal
a) Improved my overall teaching effectiveness	1	2	3	4	5
b) Improved my language arts instruction	1	2	3	4	5
c) Changed my perceptions about my students' learning abilities	1	2	3	4	5
d) Changed my instructional methods	1	2	3	4	5

Please explain these ratings:

a)
b)
c)
d)

20. Please rate the extent to which you agree or disagree with each of the following statements:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
a) I am enthusiastic about participation in this project.	1	2	3	4	5
b) Administrators at my school are generally supportive of the project.	1	2	3	4	5
c) My principal provides strong support for my teaching.	1	2	3	4	5
d) I feel a lot of stress at work.	1	2	3	4	5
e) I am satisfied with my work environment.	1	2	3	4	5
f) I feel excited by my students' accomplishments.	1	2	3	4	5
g) The project is helping me develop professionally.	1	2	3	4	5
h) I am developing teacher training skills.	1	2	3	4	5

21. How satisfied are you with your students' progress in the following areas?

	Highly Satisfied		Neutral		Dissatisfied
Reading	5	4	3	2	1
Math	5	4	3	2	1
Writing	5	4	3	2	1
Science	5	4	3	2	1
Social Studies	5	4	3	2	1
Peer Relationships	5	4	3	2	1
Self-Confidence	5	4	3	2	1
Cultural Sensitivity	5	4	3	2	1
Motivation for Learning	5	4	3	2	1

22. Please share your impressions of the project's accomplishments and/or how it may be improved:

THANK YOU!!

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Principal Interview Guide

From *Special Strategies for Educating Disadvantaged Children*, Stringfield, et al., 1994

The purpose of the Special Strategies Study is to describe promising programs which could be used as alternatives to traditional Chapter 1 programs. As you know, your school was selected to be studied as an example of such a promising program. I am going to ask you some questions primarily intended to find out how and why your school's program came into being, what it is supposed to accomplish, and how it is in fact operating. This information will help our project to learn about the process of innovation, about which elements are typically seen in exemplary programs, and about obstacles to change and how schools can overcome them.

In answering these questions, please think about how they apply to students in your school at the grade level we are studying (1,3, or 9/10).

Program Design and Development

1. Confirm the name of the innovative program in the school: ________________

2. What are the main problems the program is intended to solve?

3. When did planning for the program begin?

4. Who actually designed the program? Did the program originate within this school, or elsewhere?

5. What was your role in the development adaptation of the program?

6. To what degree were the following people involved in originally designing the program for the school?

   - National researchers/developers (e.g., Comer, Sizer, Slavin)
   - Teachers
   - District Chapter 1 coordinator
   - Other district staff
   - Local non-district people (e.g., local university professors, parent groups)

   What were their roles?

7. What are the key elements of the intended program? To what degree does the program involve changes in each of the following areas:

   - Curriculum
   - Instructional methods
   - Additional instructional staff or services
   - Additional non-instructional staff or services (e.g., counselors, social workers, etc.).
   - Adaptations to individual needs

- Groupings
- Time allocations, time use
- Class size
- Assessment
- Staff development
- Relationships among school staff
- Coordination among different staff
- Other

Content of the Special Strategy

8. What changes has the program introduced in the curriculum and instruction of the regular classroom?

9. To what degree are curriculum materials used in the regular classroom locally developed, as opposed to commercially available?

10. What specific commercially available materials are primarily used in the regular classroom?

11. Does the program provide any supplementary instructional services (such as tutoring, remedial instruction, computer-assisted instruction) beyond regular classroom instruction? If so, please describe them.

12. How similar are the curriculum materials mainly used in supplementary services to those used in the regular classroom? (e.g., same materials, same materials but different levels, different materials).

13. Do you consider the purpose of supplementary instructional services to:

    - Teach the same objectives as those taught in the regular class
    - Teach objectives similar to those used in the regular class
    - Teach objectives different from those taught in the regular class

14. When students receive supplementary instructional services, what is the usual group size?

15. For how much time do students receive supplementary services? (Minutes per day, days per week, weeks per year).

16. What instruction do the students miss when they are engaged in supplementary instructional activities?

17. With whom do program staff coordinate other instruction and services? How is coordination accomplished (e.g., joint preparation of lessons, common planning

time, informal meetings, shared records of student progress)? How effective does the coordination appear?

18. How many times per month are staff implementing this program expected to meet with each other to discuss plans or problems?

19. How many times per month do you (the principal) meet with the staff involved with this program to discuss plans or programs?

20. What programs exist in the school over and above those in the innovative program? To what degree are these programs integrated with others?

Selection of Students

21. To what degree are students selected into this school? Is the school a magnet? Does it accept or encourage students from outside of its neighborhood to attend? Can the school dismiss students who don't appear to fit into the school's philosophy? Are students selected for this particular program? If there is a school-within-a-school or students are otherwise selected to participate, how was this selection made, and how can it be changed if students either don't make it or do very well?

22. [If supplementary services are provided,] how are students selected to receive supplementary services? If different services are provided to different students, how is it decided who receives which services?

23. What specific criteria are used for entry to or exit from particular services?

Role of Parents

24. What is the school's outreach program for parents?

25. What are the formal and informal ways that parents are involved in the planning and operation of the program?

26. What opportunities, if any, are there for staff to work collaboratively with parents?

Staffing

For this program in this school, what categories of staff have been added to the program? Consider:

- Remedial reading or math teachers
- Tutors
- Aides/paraprofessionals
- Nurses
- Counselors
- Librarians
- Social Workers
- Parent liaisons, home-school coordinators
- Psychologists
- Additional teachers to reduce class size

For each job title, ask the following:

27. How many full-time or part-time staff do you have with this job title?

28. How are these positions funded (e.g, Chapter 1, Chapter 2, state compensatory education funds, special grants, local funds)?

29. Please describe the responsibilities of staff members with this job title.

30. What level of education or training is required for this position?

31. Who is involved in the decision to hire persons in that position?

32. Who is responsible for evaluating the performance of staff members in that position?

If this position is not instructional (e.g, counselor, social worker, parent liaison), go to item 34.

33. In what subject(s) do staff with this job title teach or assist?

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34. What are the three most important goals the staff member (s) in this position are supposed to pursue? (Please rank 1 to 3)

Enhancing student achievement ___
Increasing student self-esteem ___
Improving student attendance ___
Improving student behavior ___
Improving student health ___
Increasing parent involvement ___
Helping teachers with non instructional tasks (e.g., paperwork) ___
Improving student attitudes toward school ___
Other (specify ____________________) ___

35. How successful do you think the staff members in this position have been accomplishing the three top goals you just named?

36. To what degree do staff members in this position directly or indirectly assist regular classroom teachers to do a better job of teaching?

37. To what degree were teachers recruited to work in this particular school or program? (If program is school-wide, substitute school.) Is the teaching staff like that of any school in the district, or is it an unusual group brought together specifically to implement this program?

38. Who has provided training to teachers on implementation of the program? How much training has been provided, and how much more is planned?

37. Is there any procedure for helping staff implement changes in curriculum and instruction (e.g., expert coaching, peer coaching, teachers help each other, informal feedback to teachers).

38. Has the introduction of the program resulted in unusual levels of staff turn-over (e.g., staff deciding or being encouraged to leave the school, or the school becoming unusually attractive to prospective new staff?) If yes, please describe.

Budget

39. How much does the program cost to run? Does the school have funding over and above that provided to similar schools in the district? From what sources are program funds received? What proportion of funds come from each source? (We are not doing a detailed cost analysis, but would like solid estimates of budget figures). Are any changes in budget anticipated?

Program Effects

40. To what degree do you feel this program is accomplishing the following student outcomes?

	A GREAT DEAL	SOMEWHAT	NOT AT ALL
Enhanced Achievement	___	___	___
Increased Self-Esteem	___	___	___
Improved Attendance	___	___	___
Improved Morale	___	___	___

41. To what degree does the program appear to you to increase the quality of instruction students receive?

    A great deal
    Somewhat
    Not at all

42. To what degree does this program increase the amount of time students receive instruction in reading, math or language?

    A great deal
    Somewhat
    Not at all

43. To what degree does this program increase the amount of time students motivation to learn reading, math, or language?

    A great deal
    Somewhat
    Not at all

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44. To what degree does this program decrease the school's capacity to adapt instruction to the individual needs of the students?

    A great deal
    Somewhat
    Not at all

45. This program is primarily a ______________ (reading or math or language/arts/writing program. To what extent is it also affecting other subjects (e.g., social studies, sciences, and the others not listed above)?

Implementation

46. What barriers have been encountered in implementing the program successfully? Consider:

- Problems with Federal, State, or district regulations
- Opposition from key district, school, or other staff
- Opposition from parents or other community members
- Problems with teacher unions
- Inadequate financial support
- Inadequate preparation of teachers or other school staff(e.g., inadequate staff development, training)
- Problematic relationships among school staff
- Other

47. What forces have helped the program to succeed? Consider:

- Clear support/mandate from district, other political actions
- Clear support from parents, community
- Additional financial support
- Excellent staff development and followup
- Excellent relationships among staff
- Outstanding principal and/or staff
- Other

Replication

Extent of Implementation

48. When was the program first implemented?

49. How widely within the school is the original developer's vision truly shared? To what extent are school staff aware and supportive of the overall program direction?

Actual vs. Intended Program

50. To what degree do you feel that the program is being fully implemented as it was meant to be implemented?

- Fully implemented as intended
- Fully implemented with important modifications (Please describe)
- Partially implemented
- Poorly or not implemented

51. What changes have been made or are contemplated from the original program plan?

52. What plans are formulated or being discussed for:

- Full implementation of all program elements
- Modifications in the program
- Expansion to other sites or within the same school

Replicability

53. If this school is an example of a widespread program, to what degree is it seen by the program developers as a special lighthouse school (e.g., frequently visited by potential adopters).

54. Has the program been replicated in other schools, or are there plans to do so?

55. Were this program to be replicated elsewhere, what conditions would have to exist for this to happen?

Parent Survey

From *Tracking Your School's Success* by Herman and Winters, 1993

Resource A: Sample Parent Survey

Name: ____________________ F[ ] M[ ] Date: ______ Interviewer: ______________
Phone: ( ) __________ Relationship to student (mother, father, guardian, etc.): ______
Student's Name: ____________________ F[ ] M[ ] School/Teacher: ________/________
Student's Grade Level: _____ Language of Interview: Spanish English Other: __________

1. What do you know about the Model Technology Program at your school? (Write exact quote)

2. Please answer the following questions by indicating the number that corresponds to your response.

	Almost Never	Rarely	Some-times	Often	Almost Always	Not Sure/ Don't Know
a. My child enjoys going to school.	1	2	3	4	5	6
b. My child talks to me about what s/he does in school.	1	2	3	4	5	6
c. My child likes to do schoolwork on computers.	1	2	3	4	5	6
d. My child likes to do schoolwork with video equipment.	1	2	3	4	5	6
e. My child talks to me about his/her schoolwork with computers and other technology.	1	2	3	4	5	6
f. I am satisfied with how much my child learns in school.	1	2	3	4	5	6

3. In which *three* academic subjects would you like to see your child improve the most? PROBE

a. ____ English language skills
b. ____ Spanish language skills
c. ____ Math
d. ____ Social Studies
e. ____ Science
f. ____ Spelling
g. ____ Reading
h. ____ Speaking
i. ____ other ________
j. ____ other ________
k. ____ other ________

4. How satisfied are you with your child's progress in the following areas:

	Not at All	Very Little	Some	A Lot	A Great Deal	NA/ Don't Know
Reading	1	2	3	4	5	6
Math	1	2	3	4	5	6
Writing	1	2	3	4	5	6

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Science	1	2	3	4	5	6
Social Studies	1	2	3	4	5	6
Peer Relationships	1	2	3	4	5	6
Self-Confidence	1	2	3	4	5	6
Cultural Sensitivity	1	2	3	4	5	6
Motivation for Learning	1	2	3	4	5	6

The following questions are intended to gather information about parents as a group. Remember, answers to the next questions as well as to all of the questions you have answered will be kept strictly confidential.

5. How long have you lived in this community? _______ years

6. What language(s) is (are) used primarily in your home?

☐	☐	☐	☐
Mostly English	Mostly Spanish	About the same amounts of English and Spanish	Other language(s) Please Specify: ____________

7. What is the highest grade level in school that you have completed? ________________

Where did you go to school? ____

8. What is your marital status?

☐ Married ☐ Divorced ☐ Widowed ☐ Separated ☐ Single

9. What is the employment status of the adults in your household?
(Count adult #1 as respondent)

Adult #1:	Employed P-T ☐	F-T ☐	Unemployed ☐	In school P-T ☐	F-T ☐
Adult #2:	Employed P-T ☐	F-T ☐	Unemployed ☐	In school P-T ☐	F-T ☐
Adult #3:	Employed P-T ☐	F-T ☐	Unemployed ☐	In school P-T ☐	F-T ☐
Adult #4:	Employed P-T ☐	F-T ☐	Unemployed ☐	In school P-T ☐	F-T ☐

10. Are there any additional comments or suggestions that you would like to make at this time?

THANK YOU!

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Student Survey

Developed by the Center for the Study of Testing, Evaluation, and Educational Policy at Boston College for the Co-NECT school design, Bolt Beranek, and Newman Inc., 1995

Co-NECT Spring Assessment 1995

Student Reflection **Part A**

Student Name:____________________

Student Number:____________________

We are very interested in your thoughts and opinions of your school. Your ideas and suggestions are important. Please think about your school and answer the following questions based on your experiences. Thank you!

Please circle just one answer to each question:

1. Students get along well with teachers.	strongly agree	agree	disagree	strongly disagree
2. Students make friends with students of other racial and ethnic groups	strongly agree	agree	disagree	strongly disagree
3. Teachers are interested in students.	strongly agree	agree	disagree	strongly disagree
4. When I work hard, my teachers praise my efforts.	strongly agree	agree	disagree	strongly disagree
5. Most of my teachers really listen to what I have to say.	strongly agree	agree	disagree	strongly disagree
6. I am learning problem-solving skills and decision-making skills that I will be able to apply in my life outside of school.	strongly agree	agree	disagree	strongly disagree
7. There is good communication between students and teachers.	strongly agree	agree	disagree	strongly disagree
8. I have learned how to work and communicate within a group.	strongly agree	agree	disagree	strongly disagree
9. My friends from other schools would like to go to this school.	strongly agree	agree	disagree	strongly disagree
10. I feel that school is a place where I can accomplish many things.	strongly agree	agree	disagree	strongly disagree
11. Doing school work gives me good feelings about myself.	strongly agree	agree	disagree	strongly disagree

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Student Reflection Part A Page 2

12. How much television do you usually watch at home on a school day?
    - (a) None
    - (b) 1 hour or less
    - (c) 2 hours
    - (d) 3 hours
    - (e) 4 hours
    - (f) 5 hours
    - (g) 6 hours

13. How often do you read on your own for fun outside of school?
    - (a) Almost every day
    - (b) Once or twice a week
    - (c) Once or twice a month
    - (d) Never or hardly ever

14. How much time do you usually spend each day on homework for all school subjects?
    - (a) I usually don't have homework
    - (b) 1/2 hour or less
    - (c) 1 hour
    - (d) 2 hours
    - (e) More than 2 hours

15. How much television do you usually watch at home on a school day?
    - (a) Often
    - (b) Sometimes
    - (c) Never

16. How often do you watch your teacher do science experiments?
    - (a) Often
    - (b) Sometimes
    - (c) Never

17. How often do you do science experiments by yourself or with other students in school?
    - (a) Often
    - (b) Sometimes
    - (c) Never

Co-NECT Spring Assessment 1995

Student Reflection **Part B**

Student Name:____________________

Student Number:____________________

Please think about your experiences at your school this year and answer the following four questions. There are two questions on this side and two questions on the back side of this page.

Thank you!

1. **Describe the things you like best about your school.**

2. **Describe how your school is different from other schools you have attended.**

Please turn your paper over...

3. What are the most important things you have learned at your school this year?

4. Describe some suggestions you have for making your school even better.

Please turn your paper over...

Co-NECT Spring Assessment 1995
Student Reflection **Part C**

Student Name:
Student Number:

Think about the teachers and the kinds of things you do in your classrooms. Draw a picture of one of your teachers working in his or her classroom.

Progress Rubric

Excerpt from the National Center on Education and the Economy's National Alliance for Restructuring Education's September 1995 Field Team Seminar materials

NATIONAL CENTER ON EDUCATION AND THE ECONOMY
National Alliance for Restructuring Education

CHARTING YOUR PROGRESS ON THE FIVE DESIGN TASKS

A Diagnostic Planning and Assessment Checklist for School:

The National Alliance for Restructuring Education is committed to enabling all students to leave high school with the skills, knowledge, and habits necessary for being productive citizens in our democratic society in the 21st century. The Alliance's model is designed to provide schools. districts and states with the tools and assistance that will help them provide all students with the means and motivation to achieve high academic and applied learning standards

To accomplish this goal, the Alliance's work is organized around five design tasks:

- ***Standards and Assessment*** focuses on clearly defining the standards and outcomes for students and implementing complementary performance assessment systems that will evaluate students' progress toward these high standards.

- ***Learning Environments*** focuses on developing a curriculum and instructional program that will enable all students to reach the new higher standards. The incorporation of applied learning into schools' curriculum and instruction, continued emphasis on in-depth knowledge and skill in core academic subjects, the development of a comprehensive school-to-work transition system and effective uses of technology are significant components of the Alliance's learning environments work.

- ***Community Services and Supports*** focuses on creating an interconnected web of services and supports designed to prepare students for successful participation in school. Because the Alliance recognizes that schools cannot do the job alone, the work in this design task concentrates on strengthening families' contributions to and support for their children's educational progress, and ensuring that children and families have access to a range of effective community-wide services.

- ***High Performance Management*** concentrates on linking and integrating the work across all design tasks and on implementing school, district and state organization, management and governance strategies for the purpose of producing higher levels of student and system performance.

- ***Public Engagement*** focuses on identifying and implementing strategies that foster sustained public support for the systemic changes in policy and practice that are prerequisites for achieving world-class performance at all levels of our education system, and on providing programs that actively engage parents in support of their children's achievement of high standards.

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CHARTING YOUR PROGRESS ON THE FIVE DESIGN TASK

A Diagnostic Planning and Assessment Checklist for Schoo

The following checklist is designed to assist you as you make and revisit your plans for carrying out the work in these design tasks. Many of the critical design features related to each of them are included i this self assessment tool. Please use this checklist as a guide to your progress, recognizing that it cannot capture all of the nuances of your programs needs and special opportunities. This checklist is the condensed version of a set of more detailed checklists that exist on each design task and that are available for more in-depth analysis.

For the auditing process this fall, we are asking that:

1. The ratings be based on the views of at least 5 members of the leadership team (at a minimum). You are free to involve more members of the school community as appropriate.
2. A single rating (not the distribution of ratings of each individual) is created for each item.
3. The ratings are based on reflection, discussion and supporting "evidence"--ratings are not a first impression, nor a fantasy about the school.
4. The Field Team member should play an active role in the rating process, including prodding as needed to get credible ratings as a basis for real planning.

Who needs to see and use this information and when does it make sense to have the auditing phase completed? The auditing phase must help the school, first and foremost. But the National Alliance needs to see the pattern of how schools are doing — for several reasons. First, the information will help the Alliance provide direct assistance to schools as it is most wanted and needed. Second, the information lets the National Alliance report the pattern of reform, across schools, to our evaluators. We will not report the name of the schools or districts, only the patterns across the whole country.

To help us focus assistance and help you with your reform timelines, the auditing this fall should be completed by December 15. We are asking every school to have this checklist completed and copies to the Field Team by early December so that the copy arrives at the National Alliance by December 15. The data base items should also be entered by December 15 as well.

For your own benefit, plan on repeating this assessment at regular intervals to gauge your progress, focus on necessary next steps and remind you of critical components that need attention. Thanks for your hard work in looking at the status of reform at your school. We hope you find this process, and this tool, helpful to your work.

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DIAGNOSTIC PLANNING AND ASSESSMENT CHECKLIST

ASSESSMENT RUBRIC

Not Yet Considered – Not addressed in strategic plan. No assignment of responsibility, no resource devoted. Not communicated to staff, community.

Planning – Addressed in strategic plan. Responsible parties assigned and methods of implementation considered. No resources devoted, although budget may be drawn up. Communicated within leadership team, but not throughout staff or community.

Early Implementation – Responsible parties begin initial steps toward putting plan in place, or pilot under way. Resources devoted for development work or piloting. Communicated within leadership teams and those conducting pilot, but not throughout staff or community.

Functional – Implemented, though not yet at all levels. Evidence of progress clear, though problem still need to be worked out. Resources devoted. Communicated to staff, community.

Institutionalized – Implemented at all levels and included in performance expectations of responsible parties. Evidence of accomplishment clear, although periodic checks and revisions continue. Resource included in school or system budget. Communicated throughout staff, community.

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CHARTING YOUR PROGRESS ON THE FIVE DESIGN TASK

A Diagnostic Planning and Assessment Checklist for Scho

DESIGN TASK 2: LEARNING ENVIRONMENTS

4. CURRICULUM AND INSTRUCTION	Not Yet Considered	Planning	Early Implementation	Functional	Institutiona
A. The entire school program — standards, assessment, curriculum, instruction, master schedule, groupings — is organized to support all but the most severely disabled students in achieving high standards of performance.					
B. The curriculum is linked to the standards of New Standards (or to local standards that are linked to those of New Standards) and supports all students achieving the CIM.					
C. In the school, the performance standards are used to ensure that the curriculum is connected across the various grade levels (elementary, middle and high school).					
D. The school is organized so that students feel they are known well as people and as learners.					
E. The school, the curriculum and the instructional program are organized so that students' effort produces achievement; students are motivated to work hard to achieve.					
F. The school employs an integrated, school-wide approach to learning—collectively, all teachers, administrators and staff know and use instructional strategies associated with success in enhancing student learning (e.g., teachers serve as coaches; students are active and engage in projects tied to standards; teachers build on students' prior knowledge; students learn from one another and from the world outside of school).					
G. A critical mass of teachers are trained in the development of standards-driven units of study (e.g., HELPS), and the school curriculum includes a substantial number of high quality standards-driven units of study each year.					
H. The school uses student performance information (data from New Standards reference examinations, portfolios and other assessments) in an ongoing way to design and refine instruction supporting all students achieving at high levels.					

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DESIGN TASK 2: LEARNING ENVIRONMENTS

4. CURRICULUM AND INSTRUCTION

	Not Yet Considered	Planning	Early Implementation	Functional	Institutiona
I. The school has created a strong 'portfolio culture,' involving both students and teachers, in which students and teachers understand the criteria by which work is graded and can compare student work against the criteria.					
J. The school has integrated remediation into regular instruction and has structured time, financial resources and human resources to enable all but the most severely disabled students to meet high academic standards.					

Reflections

Review your ratings for this section. Then write down your reflections below, using the following questions as guideposts.

- In which areas have you made the most progress?
- In which areas do you need to devote the most attention?
- What are your most significant obstacles?
- What actions can you take to overcome obstacles and what assistance/resources will you need?

DESIGN TASK 2: LEARNING ENVIRONMENTS

5. TECHNOLOGY

	Not Yet Considered	Planning	Early Implementation	Functional	Institutiona
A. The school has a comprehensive written plan for the use of technology by students and staff that is aligned with the school's educational goals and incorporated in the school's strategic and implementation plans. The plan: integrates technology used for instruction, standards and assessments, administration, office systems, telecommunications, communication with parents and the community, and community supports and services; establishes equity of access to technology for all students as a primary goal; and includes clear guidelines for the privacy and security of student and school staff work.					
B. The school's curriculum and instructional program integrates the use of technology as a way of supporting students' learning to high levels, by encouraging active, project-based learning, communication with peers and experts, simulations of real-world problems, and access to a vast storehouse of resources.					
C. The school's technology system incorporates support for all administrative and student data management functions, including ready access to student work history and performance information.					
D. The technology funding strategy is integrated into the school budget and recognizes the need to rethink and redesign traditional funding streams.					
E. The school provides professional development to develop skills and knowledge in the uses of technology and employs technology as a means of providing professional development in all areas. Such professional development includes both formal and informal learning, including opportunities for teachers to observe other teachers using technology, opportunities for teachers to learn from students and the incorporation of demonstration and hands-on sessions within other sessions.					

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DESIGN TASK 2: LEARNING ENVIRONMENTS

5. TECHNOLOGY

	Not Yet Considered	Planning	Early Implementation	Functional	Institutiona
F. The school has networked most of the computers in the school and has integrated its instructional and administrative computer systems.					

Reflections

Review your ratings for this section. Then write down your reflections below, using the following questions as guideposts.

- In which areas have you made the most progress?
- In which areas do you need to devote the most attention?
- What are your most significant obstacles?
- What actions can you take to overcome obstacles and what assistance/resources will you need?

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Progress Benchmarks

From the National Center for the Accelerated Schools Project, August 1995

Accelerated Schools Benchmarks

What Are They?

The accelerated schools benchmarks were developed in concert with a broad group of educators active in the Accelerated Schools Project nationwide. The benchmarks may be thought of as a sketch of the different stages in becoming an accelerated school, in the areas of accelerated schools values, three principles, powerful learning, the inquiry process, and the governance structure. Benchmarks provide a tool for self-assessment, allowing a school to compare its growth in specific areas with an idealized notion of an accelerated school. Used wisely, with the understanding that benchmarks are sketches and not complete descriptions of accelerated schools, benchmarks can provide valuable feedback that helps to guide a school's efforts to implement the accelerated schools philosophy and process. The benchmarks are offered in the spirit of providing constructive guidance and are not intended to be overly prescriptive.

Who Uses Them?

Schools that have completed their first year and feel prepared to undertake the challenge of a relatively intensive form of self-assessment may choose to use the benchmarks, in combination with information collected from the questionnaire, school documents, the coach's log, and the data portfolio, to assess their progress in specific areas.

How Should They Be Used?

We recommend selecting those benchmarks that correspond most closely with your school's vision and then using the benchmarks to judge your school's progress toward the idealized notion of what an accelerated school should be. Please remember that a score of "1" doesn't signal failure, just as a score of "4" doesn't mean perfection. If your school community decides it is at level 1, look at levels 2, 3, and 4 to see where you might direct future efforts. If your school community assigns a score of 4 — look at levels 1, 2, and 3 and celebrate how far you've come!

When Should They Be Used?

At the beginning of a school's second year as an accelerated school, we suggest that the school community review and discuss the benchmarks, choose the benchmarks that most closely correspond with your school's vision, decide on the data needed to assess the school's progress at the end of the year, and designate a cadre that will work with the steering committee to ensure that the data are collected. Data collection should be completed and reports distributed approximately one month in advance of the end-of-year reflection, so that everyone has a chance to review the data. During the end-of-year reflection, the SAW should compare the school's progress with respect to the appropriate benchmarks and use the information to help decide priorities for the upcoming year.

Accelerated Schools Benchmarks

National Center for the Accelerated Schools Project

August 9, 1995

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I. In Accelerated Schools the progress of all students is accelerated through consistently powerful learning experiences.

Powerful learning for all students

	4	3	2	1	Evidence
Powerful ning eriences	Students consistently report that their learning experiences in all classes are powerful, that is, their experiences motivate them to pursue significant knowledge and skills in addition to fulfilling school requirements.	While the majority of students report that their learning experiences are powerful, as defined at left, these experiences are not yet consistent.	Some students report that their learning experiences are powerful, as defined at left, but the number who do so is a minority.	A negligible number of students report that their learning experiences are powerful.	Some type of feedback from students, e.g., survey or focus group responses, regarding students' experiences.
elerating ress of students	Those students who enter the school and are placed in remedial or nonaccelerated classes are mainstreamed or placed in accelerated classes by the time they "graduate" from the school.	Measures are in place to mainstream students in remedial or nonaccelerated classes by the time the students graduate, and a significant minority of students are mainstreamed before graduation.	Measures are being developed to mainstream students in remedial or nonaccelerated classes by the time the students graduate.	Measures have not yet been developed to mainstream students in remedial or nonaccelerated classes by the time the students graduate.	> Review records, program placement data, and program offerings to chart student progress. > Identify mainstreaming process and assess implementation.
Staff roaches nstream- students	Teachers agree that all students can and should receive the same enriched curriculum and instruction that gifted and talented students receive, know how to mainstream students, and know where to seek assistance when they have difficulty mainstreaming students.	Teachers agree that all students can and should receive the same enriched curriculum and instruction that gifted and talented students receive, but have difficulty mainstreaming students.	Not all teachers agree that all students can and should receive the same enriched curriculum and instruction that gifted and talented students receive. This issue is being discussed and explored by the staff.	Very few teachers agree that all students can and should receive the same enriched curriculum and instruction that gifted and talented students receive.	Feedback from teachers, staff, parents, and students, e.g., survey responses, focus group responses, etc.

Curriculum builds on best practices, student experiences, and interdisciplinary themes to provide relevant, challenging and aging educational experiences for students.

Curriculum

	4	3	2	1	Evidence
Program gn and elopment	All academic and extra-curricular programs are the product of careful review of current internal and external "best practices".	All academic and extra-curricular programs are being revamped to infuse them with ideas and methods identified through a review of current internal and external "best practices".	Current internal and external "best practices" are under review to identify ways in which to improve and expand selected academic and extra-curricular programs.	Academic and extra-curricular programs conform to the minimum guidelines established by the district or state.	• Using classroom observations, characterize the primary types of curriculum materials that are most commonly observable.
alized roaches iculum elopment	All curricula reflect a range of analytical and cultural perspectives on content and frequently draw upon diverse experiences of the student body, district and school community.	Selected curricular areas reflect more than one analytical and cultural perspective on content and draw upon diverse experiences of the student body, district and school community.	A single analytical and cultural perspective characterizes most curricula. Utilization of student and community experiences is infrequent.	All curricula approach content issues from a single analytical and cultural perspective. Student and community experiences are not utilized.	• Review the curriculum used in a range of classes; characterize the ways in which it incorporates different perspectives and resources.
interdisc ary riculum elopment	Curriculum and instruction build on engaging interdisciplinary themes that coordinate and unify the development of students' knowledge and skills.	Curriculum and instruction are being revamped to build on engaging interdisciplinary themes that coordinate and unify the development of students' knowledge and skills.	Plans are being developed to revamp curriculum and instruction to build on engaging interdisciplinary themes that coordinate and unify the development of students' knowledge and skills.	Academic programs are compartmentalized into discipline-based components.	• Meet with principal & teachers to discuss ways in which staff members collaborate & plan in an interdisciplinary manner. • Review student work.

School organization supports powerful learning by supporting teachers as learners, collaborators, and risk-takers, supporting their efforts to foster student engagement through group projects, creating student assessment systems that encourage collaborative work, and maintaining teacher evaluation systems that support these goals.

Instruction and Organization

	4	3	2	1	Evidence
Teachers as Learners	The teachers at this school are active learners themselves -- they read current research, attend conferences, and are involved in professional networks. Teachers constantly seek out new sources of ideas for improving their teaching.	Less than half of the teachers at this school are active learners themselves -- they read current research, attend conferences, and are involved in professional networks. These teachers constantly seek out new sources of ideas for improving their teaching.	Few teachers at this school are active learners themselves -- they read current research, attend conferences, and are involved in professional networks. These teachers constantly seek out new sources of ideas for improving their teaching.	Teachers at this school do not read current research or attend conferences, and are not involved in professional networks. They do not seek out ways of improving their teaching.	• Review the in-services that have been offered to staff in the last year and determine the number (or percentage) of staff that has participated; through classroom observations, determine the extent to which staff uses strategies from in-services in classroom activities.
Engaging truction	Instruction fosters student interest and involvement, and builds collaborative skills, through meaningful group projects.	Instruction is being revamped to foster student interest and involvement, and build collaborative skills, through meaningful group projects.	Plans are being made to revamp instruction to foster student interest and involvement, and build collaborative skills, through meaningful group projects.	Instruction does not foster student interest and involvement, and build collaborative skills, through meaningful group projects.	> Classroom observation > Teacher interviews > Student interviews
Support for k-Taking	Teachers feel supported by their colleagues, school administration, and school community to take risks and implement innovative changes in curriculum and instruction.	Teachers feel that support by their colleagues, school administration, and school community to take risks and implement innovative changes in curriculum and instruction is uneven.	Teachers feel that support by their colleagues, school administration, and school community to take risks and implement innovative changes in curriculum and instruction is weak.	Teachers feel unsupported by their colleagues, school administration, and school community to take risks and implement innovative changes in curriculum and instruction.	• Feedback from teachers.
Collaboration	There is active collaboration at this school among teachers, administrators, students, and parents regarding curriculum improvement.	Collaboration at this school among teachers, administrators, students, and parents regarding curriculum improvement is uneven.	Collaboration at this school among teachers, administrators, students, and parents regarding curriculum improvement is infrequent.	Collaboration regarding curriculum improvement is rare.	> Documentation related to reflect (e.g., regular use of case methods) >Meeting schedule for reflection, planning & collaboration >Scheduled co-teaching or mentoring activities

Teacher uations	Evaluations hold teachers accountable for student achievement in a supportive, constructive way.	Evaluations hold teachers accountable for student achievement, mainly in a supportive, constructive way.	Evaluations hold teachers accountable for student achievement, but not in a supportive, constructive way.	Evaluations do not hold teachers accountable for student achievement.	• • Feedback from teachers and parents re: accountability. • Feedback from teachers re: support.
Use of ientic ssment in uction & iculum ning	Assessment instruments are valid, i.e., accurately measure outcomes deemed important by the community. Assessment of students is systematic, providing adequate feedback to teachers to adjust instruction to student needs on a daily basis.	Assessment instruments are valid, i.e., accurately measure outcomes deemed important by the community. However, assessment of students is uneven, providing inadequate feedback to teachers to adjust instruction to student needs on a daily basis.	Assessment instruments are not valid, i.e., do not accurately measure outcomes deemed important by the community. Assessment of students is systematic, providing adequate feedback to teachers to adjust instruction to student needs on a daily basis.	Assessment instruments are not valid, i.e., do not accurately measure outcomes deemed important by the community. Assessment of students is uneven, providing inadequate feedback to teachers to adjust instruction to student needs on a daily basis.	• Use classroom observations and discussions with teachers to determine the types of assessment strategies used to measure student progress. • Through conversations with teachers, determine the ways in which they make adjustments and changes in their curriculum and pedagogy.

IV. Accelerated Schools enjoy a unity of purpose among staff, parents, students, and community members focused on making progress towards their shared vision.

	4	3	2	1	Evidence
Depth of SAW's y of purpose	In almost all cases, it is very clear that everyone at this school is striving towards similar goals.	In the majority of cases, it is clear that everyone at this school is striving towards similar goals.	It is not clear that the majority of people at this school are striving towards similar goals.	Clearly, many people at this school are striving towards different goals.	• Questionnaire data • Observational data
Implementation consensual ision-making	The consensus decision-making process is an integral part of our school's culture.	The consensus decision-making process is becoming an integral part of our school's culture.	The consensus decision-making process is not yet an integral part of our school's culture.	Decision-making at our school is not consensual.	• Questionnaire data • Observational data
Outcomes of sensual ision-making	On almost all issues, even the more difficult ones, we are able to come to consensus as a school community and move towards our vision.	On most issues, even the more difficult ones, we are able to come to consensus as a school community and move towards our vision.	On many issues we are not able to come to consensus as a school community and move towards our vision.	We have great difficulty coming to consensus as a school community and moving towards our vision.	• Questionnaire data • Observational data

V. Accelerated Schools empower all participants in the school community to make important educational decisions and share the responsibility for the outcomes.

	4	3	2	1	Evidence
Broad ticipation in ortant cational isions.	All members of the school community agree that they have adequate participation in important educational decisions.	Most members of the school community agree that they have adequate participation in important educational decisions.	Some members of the school community agree that they have adequate participation in important educational decisions.	Few members of the school community agree that they have adequate participation in important educational decisions.	• Data from students, parents, and all school staff.
Shared ponsibility for lementing ortant cational isions.	All members of the school community share responsibility for implementing important educational decisions.	Most members of the school community share responsibility for implementing important educational decisions.	Some members of the school community share responsibility for implementing important educational decisions.	Few members of the school community share responsibility for implementing important educational decisions.	• Data from students, parents, and all school staff.
Shared ponsibility for outcomes of ortant cational isions.	All members of the school community share responsibility for the outcomes of important educational decisions.	Most members of the school community share responsibility for the outcomes of important educational decisions.	Some members of the school community share responsibility for the outcomes of important educational decisions.	Few members of the school community share responsibility for the outcomes of important educational decisions.	• Data from students, parents, and all school staff.

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VI. Accelerated Schools build on the strengths of students, staff, parents, and all available resources.

	4	3	2	1	Evidence
Taking Stock	Taking stock accomplished all of the following: • Actively involving the whole school community to identify strengths and challenges. • Producing a report that provides an adequate comparison point for setting priorities and baseline data for cadres. • Building a sense of ownership and responsibility.	Taking stock succeeded in two of the following three areas: • Actively involving the whole school community to identify strengths and challenges. • Producing a report that provides an adequate comparison point for setting priorities and baseline data for cadres. • Building a sense of ownership and responsibility.	Taking stock succeeded in one of the following three areas: • Actively involving the whole school community to identify strengths and challenges. • Producing a report that provides an adequate comparison point for setting priorities and baseline data for cadres. • Building a sense of ownership and responsibility.	Taking stock did not succeed in the following three areas: • Actively involving the whole school community to identify strengths and challenges. • Producing a report that provides an adequate comparison point for setting priorities and baseline data for cadres. • Building a sense of ownership and responsibility.	• Minutes of taking stock committees • Questionnaire data • Interview data • Taking stock report
Building on gths of SAW bers	School activities and programs systematically build on the strengths of all school community members.	School activities and programs build unevenly on the strengths of school community members.	School activities and programs build sporadically on the strengths of school community members.	School activities and programs don't build on the strengths of school community members.	• Interviews • Questionnaire data
Utilization of gths	The entire school community's human and material resources are systematically utilized on problems blocking implementation of the school's vision.	The school community's human and material resources are frequently utilized on problems blocking implementation of the school's vision.	The school community's human and material resources are sporadically utilized on problems blocking implementation of the school's vision.	The school community's human and material resources are severely underutilized.	• Identify ways in which school community members are used to enhance each program. • Identify the extent to which various members of the school community (e.g., students, parents, classified and certificated staff) participate and contribute to each activity. • Obtain a list of any grants or awards received by the SAW.

VII. Accelerated Schools recognize the school as the center of expertise and promote equity, participation, communication, community, reflection, experimentation, risk-taking, and trust.

	4	3	2	1	Evidence
Promoting elerated ues	The members of the school community have created an environment where all opinions are solicited and freely and respectfully voiced, where discussion is focused and productive, where feedback is constructive and offers alternatives, where new ideas are honored and encouraged, and where every situation (e.g., new ideas, new programs, etc.) is viewed as an opportunity for learning and improvement.	Members of the school community are implementing an environment where all opinions are solicited and freely and respectfully voiced, where discussion is focused and productive, where feedback is constructive and offers alternatives, where new ideas are honored and encouraged, and where every situation (e.g., new ideas, new programs, etc.) is viewed as an opportunity for learning and improvement.	Members of the school community are planning to implement an environment where all opinions are solicited and freely and respectfully voiced, where discussion is focused and productive, where feedback is constructive and offers alternatives, where new ideas are honored and encouraged, and where every situation (e.g., new ideas, new programs, etc.) is viewed as an opportunity for learning and improvement.	Members of the school community have not begun planning an environment where all opinions are solicited and freely and respectfully voiced, where discussion is focused and productive, where feedback is constructive and offers alternatives, where new ideas are honored and encouraged, and where every situation (e.g., new ideas, new programs, etc.) is viewed as an opportunity for learning and improvement.	• Questionnaire data Discuss with school community members their perceptions of levels of trust, participation, equity, risk-taking, communication, & collaboration in the school. Ask for specific examples where appropriate. Ask for an historical perspective where appropriate (e.g., examples of how the dynamics have changed over time).
Recognizing school as the ter of ertise	The members of the school community recognize that they possess the vision and talent they need to make their dreams a reality.	Many members of the school community recognize that they possess the vision and talent they need to make their dreams a reality.	Only some members of the school community recognize that they possess the vision and talent they need to make their dreams a reality.	Most members of the school community don't agree that they possess the vision and talent to make their dreams a reality.	> Observe meetings. > Talk with school community members to gauge their perceptions of the values in operation at the school.

VIII. Accelerated schools communities work toward the vision of the school in a systematic and thoughtful manner by dentifying their own unique challenges, searching out solutions, developing action plans, pilot testing them, refining them, implementing them and continually evaluating them.

	4	3	2	1	Evidence
Integrating ry into all cts of school	Almost all members of the school community have working knowledge of the inquiry process and apply it in all decision-making situations, particularly those that have school-wide impacts. Inquiry-driven decision-making has become the norm.	Inquiry-driven decision-making is used sporadically throughout the school community. There is still a tendency to jump to solutions and not to consider relevant inside and outside data and experiences when developing solutions.	Inquiry-driven decision-making is only used by cadres and the steering committee -- not the school-as-a-whole.	Inquiry-driven decision-making is not yet utilized by cadres, steering committee and SAW.	• Obtain and review documentation (e.g., meeting minutes) or observe cadre meetings with respect to challenge areas and action plans to determine the ways and extent to which all steps of the inquiry process are being utilized.
Using inquiry ake progress rd school n	The inquiry process has moved the school closer to its vision.	The use of inquiry often results in interesting and worthwhile observations about programs and practices at the school, but it isn't clear that the school is moving closer to its vision.	The use of inquiry sometimes results in interesting and worthwhile observations about programs and practices at the school, but it isn't clear that the school is moving closer to its vision.	Members of the school community are still developing an understanding of the inquiry process and the ways in which it will be used to address identified challenge areas at the school.	• Discuss with school community members their perceptions of their use of inquiry, the challenges they have encountered, and the successes they have achieved.

Accelerated Schools employ an adaptive school organization structure where decisions are streamlined and communication flows smoothly in order to accelerate the progress of all students.

CADRES

	4	3	2	1	Evidence
Broad icipation in ool ernance	Almost all school community members (including parents and students) have participated in setting the priorities of the school and are a part of the accelerated schools governance structure (i.e., cadres, steering committee, and SAW).	Most school community members (including parents and students) have participated in setting the priorities of the school and are a part of the accelerated schools governance structure (i.e., cadres, steering committee, and SAW).	Most teachers and staff have participated in setting the priorities of the school and are a part of the accelerated schools governance structure (i.e., cadres, steering committee, and SAW).	Few teachers and staff participated in setting the priorities of the school and are a part of the accelerated schools governance structure (i.e., cadres, steering committee, and SAW).	•Review meeting minutes >Consult with school community members to determine the level of participation in setting priorities, creating the governance structure and inquiry training.
Active icipation on res	Many parents and students, and most teachers, administrators, and staff participate actively on a cadre.	Many parents and students, and most teachers, administrators, and staff participate sporadically on a cadre.	Most teachers, administrators, and staff participate actively on a cadre.	Most teachers, administrators, and staff participate sporadically on a cadre.	>Use meeting minutes and consultation with school community and coach to determine the proportion of staff actively participating in cadres.
Cadre focus primary rities	Each cadre has a clear focus and a comprehensive understanding of its primary challenge areas.	Each cadre has a clear focus and is developing a comprehensive understanding of its primary challenge area.	Each cadre is aware of its overall priorities and is developing a clearer focus and understanding of its challenge areas.	Cadres are still struggling to define its focus area and hone in on selected challenges.	• Observations and minutes of cadre meetings.
Cadres' use nquiry	Each cadre comfortably uses the inquiry process to address its challenge areas. Each cadre meets with enough frequency and duration to enable full implementation of the inquiry process.	Each cadre has been trained in inquiry and is applying it, with varied success, to address its challenge areas.	Each cadre has been trained in inquiry but many are experiencing difficulties in applying it to address the challenge area.	Each cadre has been trained in inquiry but has a tendency to be prematurely distracted by attractive solutions.	•Review with coach the training process for inquiry. > Discuss the coach's perceptions of the extent to which staff is using and understanding the process. > Use observations of cadre meetings to ascertain implementation of inquiry.

STEERING COMMITTEE

	4	3	2	1	Evidence
Definition of ring mittee role	Members of the steering committee have a clear understanding of their role and function and are consistently meeting their responsibilities.	Members of the steering committee are clear about their role and are developing mechanisms to fulfill this role.	Members of the steering committee are beginning to define and articulate the parameters of their role.	Members of the steering committee need to define their role and develop mechanisms for operationalizing this role.	•Observe steering committee and SAW meetings. > Review mtg minutes > Discuss with school community members their perceptions about the effectiveness of the governance structure, issues it has addressed, and challenges that remain.
Steering mittee munication W and cadres	The steering committee has established effective mechanisms (e.g., frequency of meetings, location of meetings, posting of minutes, meeting protocol, etc.) for communicating with cadres.	The steering committee is working to establish effective mechanisms (e.g., frequency of meetings, location of meetings, posting of minutes, meeting protocol, etc.) for communicating with cadres.	The steering committee has identified issues inhibiting communication with cadres.	The steering committee is in a formative stage.	> Discuss with steering committee members work they have done. > Observe bulletin boards or other means of communication. > Discuss with cadres ways in which steering info is communicated.

SCHOOL-AS-A WHOLE

	4	3	2	1	Evidence
Consensus ision-making	The SAW has defined procedures for consensus decision-making and successfully uses this process for all decisions brought to the SAW. All members of the school community feel an active part of a governance structure that is focused on the realization of the school's vision.	The SAW has defined procedures for consensus decision-making and a timeline for implementation. Most members of the school community feel an active part of a governance structure that is focused on the realization of the school's vision.	The SAW has defined procedures for consensus decision-making. However, there is substantial lack of clarity about the governance structure, the role and responsibility of the different levels of governance and the relationship between the governance structure and the vision.	The SAW is in the process of defining procedures for consensus decision-making. No changes in the governance structure have been made.	•Discuss with school community the parameters that they have established for consensus. > Discuss the challenges that they have faced in using a consensus process and strategies that they have developed to address these issues. > Discuss the ways in which using a consensus decision-making process has facilitated decision-making and implementation. > Observe cadre, steering, and SAW meetings. > Talk with SAW members and other participating on cadres & steering to understand the pathway taken for specific decisions and to adopt specific programs.
ımunication	The SAW has successfully developed and implemented procedures for keeping all members abreast of developments and outcomes of cadre, steering and SAW meetings.	The SAW is implementing procedures for keeping all members abreast of developments and outcomes of cadre, steering and SAW meetings.	Mechanisms for keeping all SAW members abreast of developments and outcomes of cadre, steering, and SAW meetings are being developed.	Mechanisms for keeping all SAW members abreast of developments and outcomes of cadre, steering, and SAW meetings are still needed.	> Observe bulletin boards or other means of communication. > Discuss with SAW members ways in which SAW meeting info is communicated.

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Implementation Observables Checklist

From *Charting School Progress*, Mitchell, 1995

IMPLEMENTATION OBSERVABLES CHECKLIST

Standards and Assessment

- Standards statements.
- Schedule of training and materials given to teachers to help them understand new standards.
- List of names of members of local standards committees ad example minutes of meetings copies of materials given to students, parents, and/or community members explaining new standards.
- Available documentation on the links between standards and curriculum, and standards and assessments.
- Schedule of training and materials given to teachers to do portfolio assessments and other new assessments.
- Samples of portfolios assessments.
- Samples of alternative assessment tasks not part of portfolios.
- Statements of examples of scoring criteria for portfolios and non-portfolio assessments.
- Documentation of changes in student achievement.
- Documentation on the links between curriculum and assessments.

Curriculum and Instruction

- Examples of lesson plans, units of study, etc.
- Number of lesson plans or units of study developed versus number remaining to be completed to cover full curriculum by grade level.
- Sequence across grades of new curriculum (schedule for a student).
- Other changes to courses, course content, and course sequencing.
- Documentation of connections to community in curriculum areas.
- Description of quality control mechanisms in place for newly developed curriculum. For example, teacher peer review, review by design team, etc. And, evidence of subsequent changes or

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dropped units (for example, five units dropped after peer review).

- Schedule of training and materials for teachers for new curriculum.
- Schedule for completion of all required curriculum units.
- Schedule for adoption of instructional strategies.
- Schedule and materials provided teachers for new instructional strategies.
- List of places teachers use for community as classroom.
- List of when the community has come into the classroom--speakers, performers.
- Example of schedule that allows for students' individual choices.

Teacher Professional Development

- Schedule of teacher professional development meetings.
- Workshop materials.
- Workshop attendees roster.
- School visit agendas.
- Documentation of ongoing teacher collaboration.

Technology Use

- List and location of newly purchased, design-related equipment (classroom, labs, principal's office).
- Schedule for purchasing more design related equipment.
- Schedule and materials for training.
- List of software programs/packages used.
- Examples of curriculum units incorporating technology.

School Organization and Governance

- List of names of members of various committees required by design.
- Schedule and materials for training in new governance roles.
- Schedule of committee meetings and examples of minutes from meetings.

- Significant products of the committees, such as new schedules for courses, standards for exemplary student products, new standards, plans for technology, school improvement plans.
- Newly developed rules, regulations, master contracts, site-based management plans, waivers, and district-school agreements about school level control over budget, hiring, firing, evaluation, or mission.
- Teachers' school day schedule demonstrating time for teaming, curriculum writing, paperwork, etc.
- List of incentives to encourage new behaviors.
- Documentation of new/changed staffing patterns including master teachers, apprentices, aides, volunteers, facilitators.
- Master contract changes to accommodate these roles.
- Grievances filed concerning new roles.
- Hiring/layoffs due to design implementation.
- Description of new roles for administrators.
- List of new grade combinations, teacher team combinations, etc., and when they went into effect.
- Relative number of classes covered by these new combinations versus classes that have not converted.
- Description of student placement procedures.

Family and Community Services

- Name of social services coordinator for school.
- Schedule for different activities.
- Indicators of utilization of or participation in these services.

Public Engagement

- Schedule of public meetings.
- Materials explaining reform program for parent and community audiences.
- Materials explaining reform for education stakeholder audiences.
- Samples of newspaper articles and newsletters for lay consumption.

- Community volunteer roster.
- Business/nonprofit participation agreements.

School/System/Project Partnering

- Statements of partnership objectives.
- Schedules for and minutes from partner meetings.
- Products jointly developed by partners.

Context Data Worksheet

From *Charting School Progress*, Mitchell, 1995

CONTEXT DATA WORKSHEET

Student Population

		1995/96	1996/97	1997/98	1998/99
ENROLLMENT					
GENDER	Male				
	Female				
RACIAL/ETHNIC STATUS	American Indian/Alaskan Native				
	Asian/Pacific Islander				
	African American				
	White (not of Hispanic origin)				
	Hispanic				
	Other				
LIMITED ENGLISH PROFICIENT					
FREE/REDUCED PRICE MEALS					
CHAPTER 1					
SPECIAL EDUCATION					
GIFTED/TALENTED					
MOBILITY					
STANDARDIZED TEST DATA (describe battery, form, score scale)	Grade ____				
	Grade ____				
	Grade ____				

School Characteristics

		1995/96	1996/97	1997/98	1998/99
STAFFING LEVELS	**Instructional Staff**				
	Administrative Staff				
INSTRUCTIONAL TIME	▨				
BUDGET INFORMATION	**Federal Moneys**				
	District Funds				
	Grant and Contract Funds				
	PTA and Other Fundraising Moneys				
	Other Funds				

Example Definitions for Context Data:

1. Enrollment--Number of students enrolled on 9/30.

2. Student population characteristics--Number and percent of students (on 9/30 or average daily during the official school year) disaggregated by gender, race, LEP, free/reduced price meals, Chapter 1, special education, and G&T; where applicable, the following definitions may be used for disaggregation:

> Gender--male/female
>
> Race--American Indian/Alaskan Native, Asian/Pacific Islander, African American, White (not of Hispanic origin), Hispanic, other (census categories)
>
> Limited English proficient--have primary or home language other than standard English and have limited or no age-appropriate ability to understand, speak, read or write English
>
> Free/reduced price meals--meet family size and income guidelines (US Department of Agriculture) for free/reduced price meals
>
> Chapter 1--receive services funded in whole or part by Chapter 1, ESEA
>
> Special education--students with learning or physical disabilities who have current Individualized Education Programs and are served by the system
>
> Gifted and talented--are identified as academically gifted and/or talented and receive services/programs funded by the system

3. Mobility--number and percent (of enrollment) of students (1) entering the school after 9/30, and (2) transferring or dropping out after 9/30 and before 6/1.

4. Norm- or criterion-referenced test data (if available from an ongoing program)--summaries of standardized test data reported as percentiles, stanines, normal curve equivalents, grade equivalents, or standard- or scale-based scores (include descriptions of scale or rubric definitions)

5. Staffing levels--number and percent (of enrollment) of instructional staff (staff who perform professional activities related to teaching students) and professional support staff (staff who provide auxiliary services for students or the program, including librarians, counselors, principals, administrative assistants, etc.).

6. Instructional time--average total time per day spent on instructional activities and days of instruction per year.

7. Budget information--funds from the district (per pupil expenditures and other district-provided moneys), Chapter 1, Chapter 2, Goals 2000, grant, and other funds, PTA and other fund-raising moneys.

Comprehensive Outcomes Worksheet

From *Charting School Progress,* Mitchell, 1995

COMPREHENSIVE OUTCOMES WORKSHEET

Student Population

		1995/96	1996/97	1997/98	1998/99
ATTENDANCE RATES					
PROMOTION RATES					
GRADUATION RATES					
DROP-OUT RATES					
DISCIPLINARY REFERRALS/SUSPENSIONS/EXPULSIONS					
PERFORMANCE ASSESSMENT DATA (describe assessment, rubrics, scale)	Grade ____				
	Grade ____				
	Grade ____				

School Characteristics

		1995/96	1996/97	1997/98	1998/99
TEACHER ATTENDANCE RATES					
TEACHER RETENTION RATES					
PARENT/TEACHER CONFERENCE PARTICIPATION RATES					
PARENT VOLUNTEER RATES					
FAMILY/COMMUNITY SERVICE RATES					
COMMUNITY VOLUNTEER RATES					
BUSINESS/NONPROFIT PARTICIPATION					

Example Definitions for Comprehensive Outcome Data:

1. Attendance rates--percent of students present on an average school day from 9/30 through 6/1 (or during the official school year).

2. Promotion rates--percent of students advanced to a higher grade or instructional level at the conclusion of the school year.

3. Graduation rates--number and percent of students completing minimum requirements for a high school diploma.

4. Drop-out rates (for middle and high schools)--number and percent of high school students withdrawing from high school (without transferring into another academic program) between 9/30 and 6/1 (or prior to completion of the high school program); readmitted students dropping out on a second or subsequent occasion should be counted once.

5. Disciplinary referrals/suspensions/expulsions--number and percent of students suspended, expelled or officially referred (beyond the classroom level) for disciplinary action.

6. Performance assessment data (if available from an ongoing program)--summary information from performance-based assessments, including numbers and percents of students scoring at each standard or scale level, copies of the standard or scale descriptions/rubrics, and sample student work.

7. Teacher attendance rates--number and percent of instructional staff present in school or in an approved teacher professional development session on an average school day during the official school year.

8. Teacher retention (in the school) rates--number and percent of instructional staff retained in the school from each of (1) the beginning to end of the official school year and (2) one academic year to the next.

9. Parent/teacher conference participation rates--percent of students for whom a parent or guardian attended official conferences.

10. Parent volunteer rates--numbers of parents (and percents of families) volunteering and participating in the instructional program, in administrative support of the program, in fundraising actives, and in extracurricular activities.

11. Family and community service utilization rates--by service category and overall, the numbers of (1) school families and (2) community members using social and health support services provided by the program.

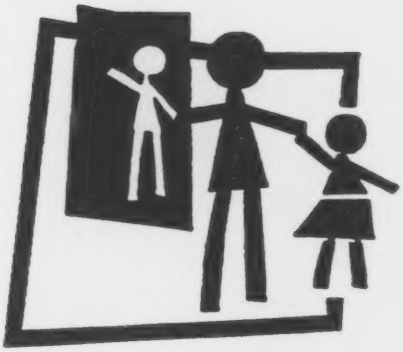
12. Community member volunteer rates--numbers of community members (not school families) volunteering in the instructional program, in administrative support of the program, in fundraising activities, and in extracurricular activities.

13. Numbers of businesses/nonprofits participating in the program--numbers of businesses partnering with or participating in the school in support of the instructional program and in administrative and financial support.

E. EXAMPLE REFORM PORTFOLIO

Excerpted from (1) *Designing New American Schools: The Co-NECT Experience*, August 1995 draft (Morrison), and December 1995 draft (Morrison, Goldberg, and Kirkpatrick); and (2) *Design for a New Generation of American Schools, Phase 2/Year 2*, July 1995, Bolt Beranek and Newman, Inc.

Co-NECT School Progress Portfolio



Fall 1993 - Spring 1995

PREFACE

The Co-NECT "school design" was developed by group within the Educational Technologies Department at Bolt Beranek and Newman Inc. (BBN), with start-up funding from the New American Schools Development Corporation (NASDC).[1] Testing and refinement of the design has taken place over a three-year period, from 1992-1995, primarily at three sites:

- Site A, a Co-NECT School since 1992, was the first to "implement" the design fully. It is currently a K-9 school, operating on two separate campuses in a city in Massachusetts. By 1997, it is scheduled to become a full K-12 school operating in a single new building.
- Site B, a middle school in a small city in Alaska, has been working with the design since 1994--a school-within-a-school at the local high school has also been using the Co-NECT design.
- Site C, a middle school in a working-class Indiana suburb has been working with the Co-NECT design since January 1995, in a "school-within-a-school" setting.

As of November 1995, we have begun to work with 12 additional schools in Dade County (Florida), Memphis (Tennessee), and Cincinnati (Ohio). This report documents the change process that has taken place (and continues) at our initial three sites, and the results that have been achieved through the hard work of our school partners.

WHAT IS A "SCHOOL DESIGN"?

The term "school design" dates back as far as the original request for proposals issued by NASDC, which sought to fund a number of "design teams" to: (1) "create and test designs for schools that achieve national education goals..." and (2) "assist communities... to adopt and create the designs for their own purposes." These "break-the-mold" designs would integrate all elements of life in a school, and would be "benchmarked" against "demanding goals and achievement standards," and would provide "dramatically better outcomes" for all students.

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[1] NASDC was founded in 1991 by corporate leaders who worked to help reform the nation's public schools. NASDC has been providing support to design teams working in 147 schools in 18 states.

The design team formed by BBN has taken these mandates seriously. Drawing on what we see as the best available research and practitioner experience, we have developed a framework, called the Co-NECT School Design,[2] consisting of twenty-six distinct design elements in five categories: school-based design; performance assessment; project-based learning; professional community; and use of technology. Most schools will have already implemented at least some of these components to some degree. For example, many schools around the country have mission statements (Design Element 1.1), but the mission statement is not always a "living" document that serves to guide the daily activities of the entire school community. Many schools have one or two computers with dial-up Internet access, but few have direct access for all computers in the school (Element 5.3).

We see our own mission as helping participating schools employ the full Co-NECT design framework (and thus become a "Co-NECT School") in a way that best meets local needs and makes the best use of local resources. Working with a school-based design team (Element 1.2), we help each school identify the features it has already implemented, and where further work is required. We then help the school develop an action plan aimed at implementing all twenty-six of the design elements as quickly and fully as possible. At the same time, we work with a school evaluation team (Element 2.6) (which may be part of the design team) to monitor the progress of implementation and track results.

Stated in these terms, the process of "designing a school," or "implementing" a "school design" may seem straightforward--and simplistically so. In fact, we are acutely aware that the process of designing or redesigning a school as an organization bears little resemblance to the sort of engineering process the term "design" may call to mind. While it is easy enough to speak importantly about "implementation," "benchmarking," "needs analysis," "action plans," and so on (and we *do* speak of these things) in working with the real people at our sites (principals, parents, teachers, students, etc.), with all their varied experiences, deeply-held beliefs, work habits; time constraints, fears, and cherished personal agendas, we have long ago come to realize that designing a school is more like raising a family or starting a new business than it is like designing a new car or industrial process--the results are far from guaranteed. An automobile that is capable of accelerating from 0 to 60 mph in 5 seconds will do that for any driver because that is what it is designed to do. But even the "best" school design will produce mediocre results without the hard work of the people who really matter--principals and parents, teachers and students, concerned community members, and school district officials. It follows that when a particular design is associated with improved results (as is the case with Co-NECT), the design can at best be credited with enabling these results, not "producing" them.

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[2] Co-NECT stands for "Cooperative Networked Educational Community for Tomorrow."

Therefore, as we discuss the "implementation" of the design at our sites, it should be understood that we are *not* dealing with a single, easily specified intervention that might be compared in any meaningful way with other such interventions--in the way that it might be possible, for example, to compare different methods of heart bypass surgery or different brands of dishwasher. Simply put, the interactions between the "design" and the unique characteristics of each school community (the intervening variables) make it impossible to establish any causal relationships between implementation of the design as a "thing" and the many outcomes that will follow. At best, we can tell rich stories about the change process as it has occurred at particular sites.

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[3] This reform portfolio reflects the observations of Co-NECT reformers; it describes program implementation levels and early outcomes during the period from fall 1993 through spring 1995. The portfolio periodically will be updated to provide a longitudinal account of school progress in relation to design goals and features. Please call or write XXX to inquire about future reports.

1. INTRODUCTION TO THE CO-NECT SCHOOL DESIGN AND MAJOR GOALS

The Co-NECT design is based on our understanding of the best reform practices in this country and abroad. It calls for schools to be organized around small multiage clusters of students taught by a cross-disciplinary teaching team. It is expected that students will stay in the same cluster, with the same teachers, for at least two years. Working within national, state, and district frameworks, teachers develop performance standards defining what students should know and be able to do. The curriculum focus is on authentic, interdisciplinary projects that give every student an opportunity be acquire critical skills and deep content understanding, as defined by the school's performance standards. At the high school level, projects focus on school-to-work transition.

Faculty representatives of each cluster serve on a school design team. Led by the building principal, with input from parents and other members of the community, the team sets overall goals and monitors results. A sophisticated communications infrastructure, featuring direct Internet connectivity, gives everyone in the school community access to the technology of the 21st century workplace and is fully integrated with teaching and learning.

The design is intended to help those who work with it achieve the following outcomes.

- *For communities*, the attempt to build a system that makes more effective and entrepreneurial use of local resources, and that is increasingly responsive to the academic, social, and career needs of children, parents, and the community as a whole.
- *For teachers*, potential results include increased involvement in professional activities, teamwork skills, technology expertise, and an expanded repertoire of teaching strategies.
- *For students*, outcomes may include deep understanding of selected topics in core subject areas along with critical skills for the workplace, citizenship, and lifelong learning.

SCHOOL-BASED DESIGN

Co-NECT is founded on the notion that the effort to transform schools must be an ongoing, *local* process, engaging the passions, ideas, and talents of those who are most closely invested in the quality of education each school provides. The desire for change (and the energy to make change happen)--must fuel a grassroots movement, supported and facilitated by parents, local business, district officials, teachers, principals and other influential segments of the community, and carried out by an empowered, accountable professional staff.

As a mechanism for helping the school community articulate a vision, then translate that vision into concrete action, Co-NECT advocates the creation of a "school design team." Using Co-NECT as a general framework, the design team develops an action plan for whole-school restructuring. Part of this action plan will be a strategy for developing multiple, "two-way" relationships between the school and other organizations and institutions in the surrounding community.

Finally, the design calls for an emphasis on empowering leadership, with responsibility and accountability for achieving the school's vision distributed through every level of the school community, from the district, down through the principals, to the youngest kindergartner.

PERFORMANCE ASSESSMENT

The Co-NECT design stipulates that assessment and evaluation should be ongoing, systemic, and focused on continuous improvement in the quality of teaching and learning for everyone. Assessment and evaluation is "standards-driven," in the sense that there is a clear understanding of what is expected of teachers, students, and the school itself.

The primary means of measuring student performance is a set of "performance standards," specifying what every student, from elementary school through high school, is expected to accomplish before moving on to the next level. Performance standards are *not* just lists of what students should know (e.g., the causes of the Civil War, the place of Earth in the solar system), nor are they the sort of vaguely stated behavioral objectives that are sometimes associated with the phrase, "Outcome-Based Education." Rather, performance standards in a Co-NECT school tend to be descriptions of concrete *products* that students are responsible for producing in conjunction with a significant *project*. For example, elementary school standards might require that students prepare an annotated list of books they have read, perform and report on a simple scientific experiment of their own choosing, compose a biography of a family member, and so on. At middle school and high school levels, performance standards become more challenging and more academically rigorous. Co-NECT provides a set of sample performance standards that local schools may use to develop standards that are consistent with their own state and district frameworks.

Along with performance standards, the faculty prepares a set of guidelines for evaluating student work called scoring *rubrics*. These rubrics, along with models of exemplary work, are aimed at helping students and parents understand exactly what is expected. Students keep their work in portfolios, which, along with teacher and student comments, become a record of the student's accomplishments and growing mastery of the school's performance standards.

In addition, Co-NECT schools are encouraged and helped to monitor results on a continuing basis, using a variety of different measures, including test scores, attendance data, records of disciplinary incidents, levels of parent involvement, and other key school performance indicators. For this purpose, it is recommended that participating schools form their own "evaluation teams." These teams have primary responsibility for monitoring results and reporting to the community.

The teams are supported by Co-NECT Critical Friends, a program begun in 1994-1995. Teams of teachers and staff at Co-NECT schools visit each other periodically to get to know each other's schools, and take a critical look at the process and progress of restructuring. The stated purpose is to give the Co-NECT community as a whole "an opportunity to support each member school in its efforts to dramatically improve the quality of teaching and learning."

Critical Friends teams attend classes, interview the principal and other members of the school design team, "shadow" students, study samples of student work, and speak with parents and other members of the community. At the end of their visit, the team presents a confidential consensus report to the school, identifying both *strengths* and *challenges*. The team does not attempt to suggest detailed solutions to perceived problems. It is up to the school itself to develop ways to address issues the team identifies.

Along with the school's own evaluations, student test scores, and other sources of information, these reports fuel the school's ongoing process of self-assessment, benchmarking, and planning. At the school's discretion, other Co-NECT schools may also share the report, or portions of it.

PROJECT-BASED LEARNING

As a pedagogical concept, the term "project" seems to be firmly rooted in the parlance, if not the practice, of most teachers. When first introduced to the Co-NECT design, teachers frequently react positively to the project-based learning component. "Oh, we're already doing projects" is a typical response.

In fact, our notion of what constitutes a "real project" differs in significant ways from the kinds of curriculum projects that many teachers are used to organizing. More often than not, projects are seen as: (a) supplemental (not a core curriculum activity); (b) focused on "making things" (e.g. posters); (c) focused on representing information gleaned from a textbook or other such source; and (d) having limited audiences (e.g., the teacher, other students, parents).

For example, in a school project of the most typical sort, a student or group of students might be asked to prepare a computer presentation on poisonous snakes, to supplement a unit the teacher is presenting on reptiles. Students spend a few class periods gathering the information from the library and typing it into the computer, perhaps verbatim. They also scan images from the books and add these to the presentation, which is shown to parents on parent night.

Compare this to a project on poisonous snakes that begins with the question, "Are poisonous snakes harmful or helpful?" As a way of answering this question, students may be asked to conduct library research, but also to interview local farmers, wildlife officials, emergency room personnel, and attempt population counts of poisonous snakes in the area, and get access to snakebite data. The results of this research are presented as part of a temporary exhibit in a local science museum. An associated report becomes part of each participating students' portfolio.

The differences between these two kinds of projects are subtle but significant to our vision of how learning takes place in a Co-NECT school. The first involves a simple re-presentation of "facts;" the second is driven by a question to which there is no simple answer, and thus requires analysis of information and careful thought, not just regurgitation. In the first, the school walls circumscribe the audience and resources, which tends to limit the scope of the project and lessen expectations for quality; the second gets students out into the community, expands the scope of information, and raises the importance of quality. The first is focused on the product itself (the computer presentation); the goal of the second is understanding of a complex problem, and conveying the understanding to others.

PROFESSIONAL COMMUNITY

The driving force behind every successful school is a professional community of teachers and administrators who have the capacity and authority to chart their own course, manage their own learning, and help make the crucial decisions that affect the quality of education they provide the children and young adults in their charge.

With guidance and support from the principal, teachers work together in self-directed, interdisciplinary teams. Teams are encouraged to manage their own learning, continually reflect on their teaching practice, carefully monitor results, and share insights and successful new strategies with colleagues near and far. To be successful, these teaching teams need common planning time, access to resources (including technology), true decision-making responsibility, and effective, empowering leadership.

BEST AVAILABLE TECHNOLOGY

The Co-NECT Design calls for schools to make appropriate use of the best available technologies, providing access to computer tools, software, and video facilities for students and staff, and creating an open communications system that connects the school to the community and the world beyond. In this way the school's technology infrastructure supports the core activities of the learning community, enhancing teaching and learning, supporting the growth of the professional community, and strengthening ties between the school and its partner organizations.

Ideally, computers are distributed throughout the school (not concentrated in separate "laboratories") and every computer has desktop access to the Internet. Every member of the school community has an email account, and access to useful software tools. Responsibility for managing the school's information infrastructure is distributed among several people. As a result, we begin to see the emergence of what Co-NECT design documents refer to as a "technology culture." Among other things, this means that (1) all members of the school community are becoming expert at different uses of technology; (2) there is an established culture of knowledge sharing--"everyone is a teacher, everyone a learner;" and (3) as a group, the school community is becoming sophisticated about both the potentials and limitations of different technologies.

Finally, and perhaps most importantly, we expect to see appropriate use of technology throughout the curriculum, in all aspects of teaching and learning.

2. DESCRIPTION OF THE CO-NECT SITES

SITE A

Site A is a public school in the northeast that prides itself on being the first school in the nation to test and refine the Co-NECT design. It has been largely through the work of the school's principal and her faculty, the Co-NECT has become something more than a paper document.

School A is in urban center with a population of 190,000. The district serves these residents through 42 elementary schools, 5 middle schools, and 4 high schools. In 1994-1995, 440 students attended the school, of whom 52 percent were classified as white, 32 percent Latino, 10 percent black and 6 percent Asian.

Two years prior to becoming a Co-NECT school in 1992, school A was a K-6 school that had been made a magnet for the city. The magnet plan was developed because the school had a much larger minority population than the district as a whole and it was hoped that the school could attract students from other areas of the city to bring the school into better racial balance. To do this the district brought in a new principal, who developed a planning document designed to attract a broad range of students. The plan was similar in flavor to the Co-NECT design, though less radical.

In becoming a Co-NECT School the school expanded to grades 7 and 8, with plans to add a grade each year after that. Because there was not enough room in the original building for additional students, a building was acquired on the other side of the city. The building itself caused numerous problems at the outset. Originally designed as a nursing home, it lacked facilities and equipment (such as wiring and a library) that were necessary for the proper functioning of a Co-NECT school. Partly as a result of this, implementation of the Co-NECT technology design was delayed at the outset.

While the school has a high student mobility rate, those students who stay at the school are active in and outside the classroom. Only

39 percent of the students who were enrolled at the beginning of the 1993-94 school year were still enrolled at the end of that year, but on the average, almost 92 percent of the students attended school daily. Only a small proportion of these pupils, 10 percent, were referred for some kind of disciplinary action. Less than 10 percent were receiving special education, and these students were included in the regular classrooms.

Due to its recent restructuring, the school had a new faculty who have shown much interest in integrating technology into their classrooms. Of the 46 member teaching staff at the school (which include teacher aides) 43 have obtained a B.A. or higher; 13 have an M.A. or higher degree. None of the teaching staff has taught in the school for more than three years, but several have engaged in non-required professional activities.

At the time the Co-NECT design was first implemented, a new superintendent and assistant superintendent were appointed. Both have been supportive of the implementation, but are concerned that all schools in the district be treated equally. They have stressed to the school the importance of mathematics and have encouraged the school to try to raise its scores on the state-mandated tests.

SITE B

As the 1994-1995 school year began, a middle school and high school program, both located in the far north, began implementing the Co-NECT design in their schools for the first time. A small city serving as the state capitol, it has a population of nearly 28,000 residents. The district operates eight Site Buildings, serving just over 5,400 students. These include five elementary schools serving over 2,600 students, two middle schools serving a little under 1,300, and a high school with nearly 1,500 students. In 1994-1995, the district's racial composition was 71 percent white, 19.3 percent Native Alaskan, 5.3 percent Asian, 2.3 percent Latino and 2 percent black. The budget totaled a little more than $35.5 million, with per pupil expenditure averaging about $6,500.

The recent history of educational reform in the district may be traced back to May 1981 when the Site Board called for the adoption of a new "middle school" philosophy for local schools, combining grades 6-8. The new middle school community adopted several ideas that have since become popular in the reform movement. One of these ideas included interdisciplinary teaching and learning, with two to five teachers sharing the same students and similar schedules. The district allotted these teacher teams common planning time periods to discuss students and collaborate on teaching techniques. Other ideas include a flexible block schedule and multi-age grouping.

In addition to increasing change at the district level, the middle school was experiencing change as well. The district had decided to make considerable investments in new technology for education through a bond grant program and had targeted the school as a benefactor of these plans. As part of this investment, the school would relocate to a brand new facility at the start of the 1994-1995 academic year.

In the first year at the new site, the middle school had a population of 530 students with 65 percent white and 35 percent minority (26 percent Alaska Native, 5 percent Asian, 2 percent black and 2 percent Hispanic). Many of the students fell under the at-risk category. Students in the school come from varied backgrounds and socio-economic classes.

The school had already undertaken several restructuring initiatives prior to becoming a Co-NECT school. One of the most important of these was to crate three separate "houses" within the middle school, each functioning as a smaller school community, with the idea of better addressing students' individual needs and interests. Students remain in their houses for all three of their middle school years.

Teachers formed these houses themselves, and tended to join with teachers with similar experiences and educational philosophies. Faculty who teach special subjects called "exploratories" (e.g., art, music, home economics, etc.) comprised a fourth house, serving the students in the other three houses.

Other initiatives which were already underway included some early experimentation with student project work, and the practice of site-

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based governance and decision making. Prior to 1994-1995 the school had a governance council and smaller "focus groups," which concentrated on solving problems within specific categories: communication and school climate, curriculum and instruction, and student services and facilities.

The secondary school is an alternative high school housed at a former middle school with a staff of 6 teachers and 148 students. The middle school has 643 students and 34 teachers grouped in three separate "houses," served by 12 administrative and support personnel. Each house has its own decision-making process.

With the appointment of a new superintendent who is supportive of Co-NECT, there appears to be fairly strong district support for expansion of the program. Plans are being developed to add one or more elementary schools during 1995-1996, and to extend the high school program.

SITE C

An urban center with a population of about 85,000 people, during school year 1994-1995, operated a total of 25 schools and enrolled approximately 13,500 students. This included 16 elementary schools serving about 6,200, 5 middle schools serving about 3,300, and 4 high schools serving about 4,000. The district placed heavy emphasis on the inclusion of special education students and has bilingual programs serving approximately 350 students.

The Co-NECT middle school is located in the area characterized by its parks, residential neighborhoods and a historic Little Red Schoolhouse. Students come to school from a wide range of socioeconomic backgrounds. Homes range from single family dwellings to apartment complexes.

During the 1993-1994 school year, the school enrolled approximately 800 students, 26.5 percent of whom were minorities. The school has a low mobility rate. As many as 85 percent of the students who enrolled at the beginning of the 1993-1994 school year were still enrolled at the end of that year. Accompanying this low mobility rate, 91 percent of the students at the middle school attended school daily. While the school did not operate a full inclusion program, special education students attended both special education and regular classes.

The 64-member teaching staff includes teachers, aides and paraprofessionals, While none of the 12 teaching aides on the staff had obtained a B.A. degree, 37 of the remaining 52 faculty members possessed an M.A. or higher degree. About 38 percent of the teachers had practiced there for 20 or more years; 17 percent had practiced there for more than 10, but less than 20 years; 30 percent for 3-9 years; and, only 13 percent for less than 3 years.

The district has recently implemented an initiative aimed at giving teachers more decision-making responsibility, including the power to interview and choose the school's principal. The faculty selected the current principal in 1993. Thus, when the school adopted the Co-NECT project, the principal was only beginning his second year there.

3. DESCRIPTION OF IMPLEMENTATION LEVELS AND OUTCOMES

The Co-NECT design is based on five key elements: school-based design; performance assessment; project-based learning; a strong professional community; and access to the best available technology. In this section we look at each design element in turn and the degree to which it appears to have been implemented at the sites as of June 1995. The information pyramid format described in Appendix A is fully illustrated for the technology element on page 179. General descriptions of Co-NECT implementation levels and early progress for the other design elements are given here for interested readers. Broad student and school outcomes also are described.

SCHOOL-BASED DESIGN

Implementation Levels and Early Outcomes

The process of community-bound design begins with a shared vision. Local school design teams work with Co-NECT to tailor the basic design to local needs, goals, and resources. A Co-NECT school is autonomous, connected and accountable.

Although a shared community-wide vision is seen in Co-NECT as the force that drives the whole-school change process, our experience to date that change is more likely to be associated with the efforts of individuals (such as the building principal) or specific groups of teachers within a school. Ideally, the school design team, with support from a district team, sets school-wide policy, and supports the work of teaching teams for the individual clusters. In practice, one or more of these linkages is somehow faulty. The school design team, for example, may find itself operating without the full support of the district. Or the cluster teams may pursue independent agendas, shaped more by the personal philosophies of the cluster teachers than any larger, school-wide vision.

At Site B, a shared school-wide "vision" has been slow to emerge. The middle school and high school faculties do not meet regularly with each other, and thus do not have the kinds of ongoing conversations that help foster a common vision. Also, although the "house" structure at the middle school level has tended to encourage local decision-making, this may have come at the cost of a faculty-wide commitment to whole-school restructuring. Some houses have moved more slowly than others in fully and whole-heartedly adopting certain key elements of the Co-NECT design such as project-based learning and multiage grouping.

The situation is even more problematic at Site C. In addition to six different design teams working with the Co-NECT design (focusing separately on project design, staff development, scheduling, community, assessment and technology), Site C also has a "planning team" composed of five teachers, three parents, and the principal. The team was in place before Site C fully adopted the Co-NECT design, and it has concentrated its efforts heavily on how to implement this design as a pilot project of a school within a school. Unfortunately, the faculty is about equally divided between those who are relatively supportive of efforts to "implement" Co-NECT, and those who have attempted, with partial success, to block these efforts. As a result, and in spite of fairly strong parent support for Co-NECT, only half the school is working with the design as we go into 1995-1996.

Site A, which has been working with Co-NECT the longest, has what is probably the most mature and consistent sense of itself as a unique institution with a unique mission. A site visit by researchers from RAND Corporation in June found that the faculty now "speak the design language" and have taken steps on their own initiative to "promote the design and its implementation."

However, it must be noted that a questionnaire administered to the Site A faculty in June indicated mixed feelings about the degree to which there is a common vision, with only slightly more than half (56 percent) of faculty agreeing that the school community has a shared vision. It may be that teachers are interpreting the question to refer to the community as a whole (one comment referred to "negative feelings" in the outside community), or it may be that there is somewhat more divergence of opinion than may appear on the surface.

As a result of our experiences, we have now begun instituting a more detailed "Framework for Change" in which detailed mutual expectations for results are outlined in a phased approach to implementing the design

Implementation Levels and Early Outcomes

Co-NECT schools set high standards of performance for all students. Stated in concrete terms, the school's standards give administrators, teachers, students, and parents a strong sense of purpose and provide an authentic means of demonstrating progress from kindergarten through high school. A school also needs to set standards for its own performance as an institution of learning, monitoring its ability to provide all students with the opportunity to achieve high standards, and periodically reporting results to the community

Specifying performance standards, developing rubrics, and collecting models of student work is a long and involved process. Not surprisingly, at the end of the academic year 1994-1995, our sites were at different stages in this process, although all had done work.

Site A appears to have made the most progress. Working in teams, the faculty have been identifying performance standards for each level within the school: primary, intermediate, and advanced. For each performance standard, teachers have been defining assessment rubrics, and have begun to assemble a collection of work samples that illustrate exemplary work.

As hoped, the task of defining performance standards has encouraged the entire school community at Site A to think hard about what should be expected of students. One of the site's own document puts it this way: "It [the process of developing performance standards] has forced us to focus not only on what we expect students to be able to do, but to make sure that there is a common understanding among all components of the school--students, parents, teachers, and the greater community--about what is meant by 'developing,' 'proficient,' and 'distinguished' work."

A report from a critical friends visit in November, 1994 confirms this view, citing evidence that the school had made progress in establishing portfolio standards and rubrics, but questions the extent to which all students had managed to assimilate the rubrics. The faculty is fully aware that this part of the job is far from complete. When the design questionnaire was administered in the spring of 1995, only 48 percent of the faculty viewed this component of the design as fully implemented.

The critical friends program has been widely viewed as successful, at least by those who have been most directly involved. Participants report that they gain insight into their own practices by viewing other teachers at work. Although members of host school faculties are likely to claim that the reports "contain nothing we didn't already know," they also typically acknowledge that the inventory of strengths and challenges is "something we needed to hear."

Anne Thomas, a teacher at the Scott Middle School, had this to say:

> Since we are all involved in the Co-Nect design, the feedback is more valuable than if it came from an outside group. We know that our "critical friends" truly understand what it is that they are evaluating, and will give us the most honest feedback possible in order that we may improve our schools. The host school receives the feedback from the critical friends, which allows them to grow to meet their challenges, while the visiting sites are able to dialogue with all parties involved. It was through all of this dialoguing that people were able to share their ideas and concerns, and find that all parties involved share many of the same concerns and challenges.

A RAND report calls the Co-NECT Critical Friends program, with the follow-up video conferences a "very positive step," noting that the process allows the school faculty to "see itself in perspective" and to receive constructive criticism from valued colleagues representing other Co-NECT schools.

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PROJECT-BASED LEARNING

Implementation Levels and Early Outcomes

Co-NECT students work on safe, interesting, and academically challenging projects during a significant portion of the school day. Projects provide opportunities for students to apply and develop basic skills, apply and extend interdisciplinary knowledge, collaborate and communicate, and construct new knowledge and understanding.

Not surprisingly, the quality of projects undertaken by Co-NECT teachers has varied. Certainly, there have been many ambitious, community-oriented projects. For example, at Site A students and teachers have been working with the local bar association to have high-powered crossbows classified as "lethal weapons." They've traveled to Washington for a private interview with the attorney general. At Site B students have worked in cooperation with the Forest Service and other agencies to create an on-line information service.

At the same time, while projects have become increasingly ambitious, and have led to authentic products and significant community involvement, there is a concern that too many of these projects still involve telling about phenomena on a superficial level, and too few involve true inquiry and analysis, leading to deep understanding of complex topics. For example, in November 1994 after visiting Site A, the critical friends team, while acknowledging that curriculum projects have helped foster a "strong oral culture and appropriate focus on group communication skills, public speaking, etc.," called for the school to work on developing a "sense-making culture" and to "improve understanding, application, and extension of knowledge." The Critical Friends report to site C talked about the need for project work to "extend, refine, and apply interdisciplinary knowledge, invite curiosity, and generate inquiry."

Too often, projects at all three sites were: (a) viewed as supplemental (not a core curriculum activity); (b) focused on "making things" (e.g., posters); (c) focused on representing information gleaned from a textbook or other such source; and (d) having limited audiences (e.g., the teacher, other students, parents). As a teacher at Site C put it, "We haven't built all curricular areas into projects yet. I believe our problem is our choice of topics. Only a few so far have been multidimensional."

A second and continuing concern has to do with the relationship between projects and "basic skills." One issue is whether or not students can learn, or be taught, basic skills such as reading, writing, and calculation in the context of projects. Although a fundamental principle underlying the project-based curriculum is the idea that projects provide meaningful and authentic context for developing basic skills, the Co-NECT design acknowledges that projects are not the only suitable context for learning and suggests that schools offer what the design refers to as "seminars" and "workshops."

Unfortunately, there is some evidence the sites have sometimes used this as a "loophole" in the design, providing a kind of sanctuary for traditional, teacher-centered instructional activities. The critical friends report on Site C, for example, stressed the need for "contexts in which students can acquire basic skills and the critical skills...*in ways that are as interesting, engaging, and challenging as in their project work.*"

Although teachers and design team members have had reservations abut the quality of projects, parent responses have generally been positive. The following statements, from parents at Site C, are typical:

> My son did not have any idea where the library was for the past two and one half years. Now I have a problem keeping him out of the library in the evenings.
>
> At about 11:00 one evening I walked into my daughter's bedroom. She had a flashlight on and was finishing her report on the Holocaust.
>
> I believe this program is getting my son ready for the real work place in the real world.

In spite of initial concerns on the part of many teachers, another feature of the Co-NECT model for teaching and learning, multiage or multigrade grouping, has also been generally successful. A teacher at Site C reported: "Yes, we have extremely heterogeneous groups. This is a strong asset to the design. What a difference this had made." The difference comes from allowing students to play different roles and take on real responsibility. "Sixth graders are beginning to model more appropriate behavior. Eighth graders are adopting a nurturing attitude towards sixth and seventh grade students. Teachers feel that the multi-age grouping has encouraged our students to move ahead." says the principal at Site C.

PROFESSIONAL COMMUNITY

Implementation Levels and Early Outcomes

Teachers are the ultimate agents of change in any school. Teachers in a Co-NECT school direct their own professional development as part of the school design process. Teachers are organized in cross-disciplinary, cross-age clusters with professional decision-making responsibility, accountability, and common planning time. Professional development relies on networking, mentoring, classroom research, and identification of workable ideas and resources.

The creation of a sense of professional community--based on the formation of empowered, accountable cluster teams (teaching teams)--is one of the first things we look for in the early implementation of the design. In fact, in all of our sites, the building principals have worked hard to empower teachers and foster a sense of professionalism. Although these efforts have been largely successful, some teaching teams are (unsurprisingly) more "committed" than others.

At Site A, the cluster teams are firmly established as a key organizational component. The teams are scheduling events and seminars together, brainstorming ideas for projects and sometimes teaching them together, discussing and understanding the students in their clusters better, and learning about different approaches that they can take to manage and carry out their work. Most of the teachers are learning about different approaches that they can take to manage and carry out their work. Most of the teachers find this a novel experience, and voice strong approval for the teaming. They have reportedly found it an empowering experience: they control much of the curriculum, assessment, and scheduling.

At Site B, each of the four teaching teams has a unique dynamic and has developed differently. Teachers on one team formed (by some accounts) a tighter-knit group than teachers on the other teams. According to this view, this is the house in which the design has been most fully adopted. Another team consists of a group of experienced teachers who were reportedly enthusiastic about the Co-NECT design, but who initially lacked a cohesiveness and sense of direction. Teachers on another team have moved even more slowly than the others in coming together as a team. As a result, the Co-NECT design is least fully "implemented" in this third house.

A fourth house, consisting of "specials" (i.e., teachers of music, life skills, the arts, health and physical well-being, technology sciences, etc.) did not have common planning time, and therefore had little opportunity (at first) to collaborate with other teachers in implementing the Co-NECT design. More recently, these teachers have reportedly begun to work together as a team and now collaborate with other teachers in the school on selected projects.

At Site C, where Co-NECT is viewed as an alternative "program," the Co-NECT teachers have formed a fairly cohesive team with of empowerment and a unique identity as the "Co-NECT" teachers.

All in all, there is evidence that the emphasis on common planning time for teachers, the Co-NECT Critical Friends program, and faculty involvement in administration, scoring, and analysis of student portfolios and performance tests have resulted in an increased sense of professional community at all three of our Co-NECT sites.

- Using electronic mail, video teleconferencing, and the Co-NECT School Exchange, teachers and staff at all three schools had to communicate with each other, discuss issues of common concern, and plan joint projects.
- Teachers at all three sites were working hard to develop performance standards and incorporate them into curriculum and assessment activities. As a result, teachers are more focused on goals and progress toward goals.
- The Co-NECT Critical Friends program had a strong impact at all three sites. As a result of the visits, the schools have a more objective picture of both progress and remaining challenges. Teachers who have participated in the visits have

returned to their classrooms with new perspectives and a renewed commitment to improve their own teaching

BEST AVAILABLE TECHNOLOGY

Implementation Levels and Early Outcomes

The Co-NECT design provides a vision of a technological infrastructure featuring unimpeded access to video equipment, computers and software tools for all members of the learning community, and a flexible communication network linking all computers in the school with each other, and with computers around the world.

- The full Co-NECT community came "on-line" in February 1995. Co-NECT teachers at all three sites now have email accounts, and are beginning to use email to communicate within the building and with colleagues at other Co-NECT schools. In addition, each site has its own Internet server, which means the site can create its own email accounts, set up and subscribe to news groups, and manage its own World Wide Web site.
- Co-NECT is becoming a "virtual" community. Our central information service, the Co-NECT Exchange (http://co-nect.bbn.com) now points to each of our partner sites, and makes some of our design documents available on line. In addition, email has enhanced our ability to communicate with key people at the sites and to respond to requests in a timely manner.
- The emergence of a true "technology culture" has been slow. At every site, there are now several teachers who are beginning to use computers for their own professional development, to locate resources on the Internet, and to communicate with colleagues in other schools. Using electronic mail, video teleconferencing, and the Co-NECT School Exchange, these teachers are beginning to communicate with each other, discuss issues of common concern, and plan joint projects.

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- Students enjoy the emphasis on technology, and are beginning to learn how to use the new tools on their own, without direct instruction. There are many cases of students helping teachers learn to use the computers.
- Students appreciate the freedom and responsibility associated with the technology-based project-centered curriculum. They develop a sense of ownership over their project work that teachers do not see with a textbook-driven curriculum.
- There is a continuing concern that computers are only beginning to be used to improve the quality of learning for the average student. In particular, it seems that available mathematics and science software is being under utilized.
- Surveys indicate that parents are particularly happy with the increased opportunities for students to use technology and the school's project-based curriculum.

BEST TECHNOLOGY USE

Research and Additional Observations

The observations given above and described here draw on a variety of data sources including interviews with staff, reports from Critical Friends visits, a recent RAND report based on school site visits, and administrations of our Co-NECT design questionnaires to students, parents and staff members in 1994 and 1995.[4] We also collected documentation on the numbers of computers available to students and staff, the numbers of network connections, and usage figures for program participants. We start with these data.

We began our partnering with current sites by trying to learn about community access to technology and about their network capabilities. Our site partners conducted inventories of equipment, software, and network connections. We tracked the data into the second year. At Site A the following resources were and now are available:

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[4] Complete data reports were available only for Site A at this writing; please do not cite--some site data are preliminary or uncomplete.

	1993/94	1994/95
Number of working computers in the school	137	183
Average student/computer ratio	1.3	1.3
Percent of computers placed in computer labs or other special rooms	10.2	7.6
Number of computers in the school networked to computers in other rooms		148
Number of computers in the school with direct Internet access		105

In 1994 and 1995, design questionnaires were administered to students (spring 1995), teachers (August 1994), and parents (fall 1994) at Co-NECT sites; surveys focused on support for design tenets and on design implementation levels. Instruments relied on combinations of open- and fixed-response questions. In their ratings of the 26 Co-NECT design elements, teachers at Site A said they strongly valued the design's emphasis on technology. Large numbers of staff (from 88 percent to 92 percent) said that (1) technology access for all students and teachers, (2) local area network capabilities, (3) desktop Internet connectivity, and (4) Co-NECT's notions about a school technology culture were important to them personally. In response to questions about the levels at which these design elements were implemented in their programs, between 58 percent and 81 percent of teachers (across elements) said these elements described their school.

At the same time, we collected information about the integration of technology with teaching and learning. We wanted to learn whether and to what extent students were using computers to collect information, analyze data, and present results. The school team reported that all students were using computers as part of their instructural program; similarly all teachers were using them as part of their professional work. In response to the surveys, while 89 percent of teachers said it was important to them that, where appropriate, computers and other technologies be well integrated into learning and teaching activities, 58 percent said such integration described their school.

Observations by the RAND site team, Critical Friends, and others provide additional information about the integration of technology with teaching and learning. Observers saw students beginning to help each other learn computer skills, students developing scripts, reading news, conducting interviews, running cameras, and controlling Site Broadcasts. Critical Friends observers noted some challenges. They said the school needed to expand the software library in order to support students and help teachers with classroom management. Students need to learn productive use of existing software, beyond word processing. Further attention is needed to developing and implementing strategies for disseminating computer expertise among teachers and students. RAND's report, similarly, was somewhat critical of the degree to which computer technology has changed the educational experiences of students in the school; they said,

> Observation of classes and discussions with staff did not reveal strong notions of how to use computer technology to effectively or significantly enhance educational experiences. The technology in the classrooms was being put to rather mundane uses . . . that did not live up to the . . . claim that computer technology has significant potential to change curriculum and approaches to learning.

Our discussion of technology use closes with a description of student and parent survey information. In response to open-ended survey questions about the things they most liked about their school, intermediate (29 percent) and advanced level (54 percent) students at Site A most frequently discussed computer and video technology. Likewise, parents most frequently gave technology, projects, and multi-age classes as project strengths. One or more of these was mentioned explicitly by 43 percent of the respondents. In response to a question about the most important things they had learned all year, students most often mentioned science and computers. Additionally, they said they liked the freedom and responsibility associated with the technology-based, project-centered curriculum. An interactive research project conducted by the students appears below.

BEST TECHNOLOGY USE

Tracking the Wolves Interactive Research Project

"Tracking Timber Wolves" on the World Wide Web

'"Tracking Timber Wolves" is a multi-media, interactive Earthwatch research project developed in collaboration with BBN as part of the New American Schools Development Corporation Co-NECT School project. You can access "Tracking Timber Wolves"on the World Wide Web.

Why "Tracking Timber Wolves" is on the WWW

This version of "Tracking Timber Wolves" was created to help teachers who want to do project-based learning in their school. This is an effort to reach out and engage a broader audience in using what's here and extending it.

How to Get There:

1. Use an Internet brower like Mosaic/Mosaic Netscape..

2. Load the following URL to go to the Earthwatch home page:

http://copernicus.bbn.com:70/0/WWW/EW_WWW/EWhome.html

3. From there you go to a map of North America, showing the various Earthwatch expeditions in which Co-NECT teachers are participating as team members and 'teacher-project developers.'

4. For a demonstration of how an 'nteractive' project-based curricula might work, select "Tracking Timber Wolves."

What "Tracking Timber Wolves" is About:

Since 1985, Earthwatch volunteers under the guidance of renowned wolf biologist, Dr. L. David Mech of the U.S. Fish and Wildlife Service, have been investigating the behavior of free-ranging wolves in Minnesota's north woods with the objective of helping existing populations of wolves survive in the wild, andre-introducing wolves in regions where they have been eliminated.

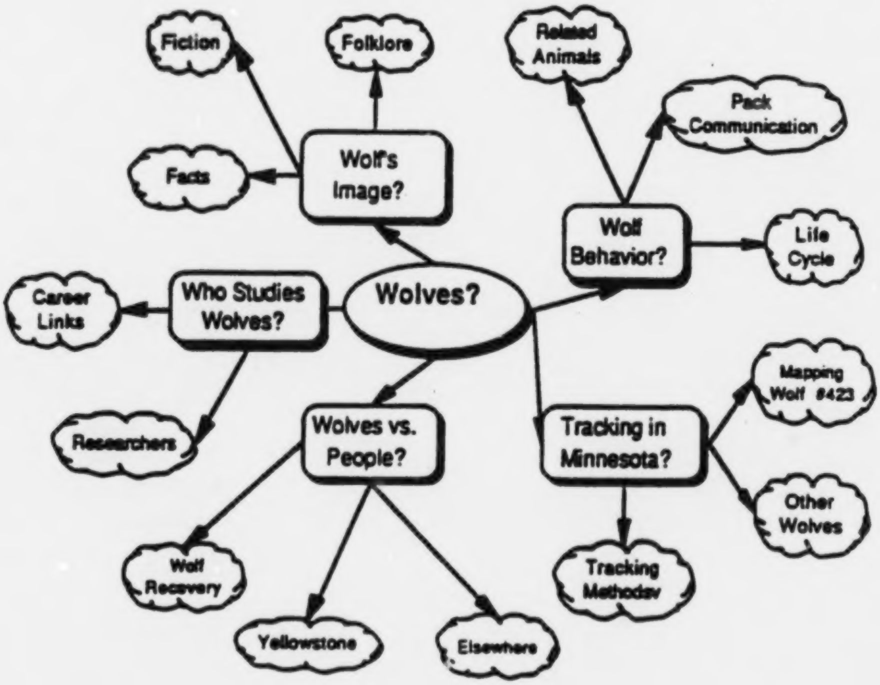
"Tracking Timber Wolves" on the World Wide Webtakes primary resources from the Earthwatch field research—photographs, maps, and data— and presents them as a starting point for generating interest and investigation about wolves. For example, you can follow the travels of Wolf #423 over a 24-hour period by plotting the radio sitings of his locations just as the researchers do in the field. This raises questions about what exactly Wolf #423 is up to late at night, or in the early dawn hours.

"Tracking Timber Wolves on the Web" then points to a myriad of other resources on the Internet, that can be accessed in minutes:

- Most recent aerial sitings of Minnesota wolves from the US Fish and Wildlife Service
- Archived research from the International Wolf Center
- Profiles of wolf biologists and others making a career from studying wolves
- Legislation around re-introducing wolves in Yellowstone National Park
- Popular stories about wolves, Native American folk tales
- News group discussion of wolf books, wolf hybrids, and wolf politics.

How It is Organized

This map of investigation paths grew out of work with teachers and students. The map helps to provide a framework upon which you can build and to which we encourage contributions.


Fiction
Folklore
Related Animals
Pack Communication
Facts
Wolf's Image?
Wolf Behavior?
Life Cycle
Career Links
Who Studies Wolves?
Wolves?
Mapping Wolf #423
Researchers
Wolves vs. People?
Tracking in Minnesota?
Other Wolves
Wolf Recovery
Tracking Methodsv
Yellowstone
Elsewhere

Join in the Howling and Have Fun (ArrooOOO!)

As you will discover, wolves howl for many different reasons, not just at the full moon or on cold winter nights. They howl for pure pleasure, and communication with one another. So let's howl, and have fun.

In the process, please let me know:

- Where you go
- What you find interesting
- How we can best share and learn from each other on what we're doing
- If I can be of help

Meg Little Warren (mwarren@earthwatch.org)

BROAD STUDENT AND SCHOOL OUTCOMES

At the end of 1994-1995, all three Co-NECT sites were beginning to see significant progress in a number of key areas, including: parent and community involvement, student engagement, and student performance. These results reflect the hard work of local principals, teachers, parents, students, and other community members.

Student Performance and Engagement

CSTEEP (the Center for the Study of Testing, Evaluation, and Educational Policy at Boston College) has been working with Co-NECT to track student performance in reading, writing, science, and math. The test battery includes items taken from the National Assessment of Educational Progress (NAEP) and the Urban District Assessment Consortium (UDAC).

- The CSTEEP battery was administered to a sample of students at Site A in the fall and spring of the first year of implementation (1993-1994) and again in spring 1995. At the intermediate level (grades 3-5), in all curriculum areas there was a significant increase in scores on the group performance items, all of which require students to work either in pairs or groups of three or four. On the NAEP reading items, scores rose from 32 percent correct in fall 1993 to 45 percent correct in spring 1994 to 47 percent in spring 1995.
- The results for the advanced level (grades 6-8) at Site A were mixed, but were superior to comparable schools on the group performance items. The median percentage correct on performance math tasks increased from 31 percent in fall 1993 and 49 percent in spring 1994 to 80 percent in spring 1995. For performance reading tasks, improvements were from 63 percent correct in fall 1993 and 65 percent in spring 1994 to 82 percent in spring 1995.

- At Site B, baseline performance was strong in comparison to national and/or urban comparative data, especially in the area of science. Additionally, unlike most schools that show poor performance on items requiring students to work together, baseline performance at Site B on cooperative items was also relatively strong. Despite strong baseline performance, performance in the spring on open-ended items showed noticeable improvement, particularly in the areas of mathematical problem solving and abstract thinking skills. However, a slight decrease in performance on reading items occurred.
- Teachers at Site C achieved their goal of improving students' abilities to work cooperatively. On a majority of math and science performance items, the percentage of students who successfully completed the task rose by at least 10 points from the baseline assessment in the fall of 1994 to the follow-up in the spring.
- Student scores on open-ended reading items rose at Site C as well. Whereas only 31 percent of the students that participated in the baseline assessment were able to construct meaning based on a passage they had read, during the follow-up assessment, 41 percent of participating students performed adequately on these items. On items that asked students to extend meaning, performance rose from 32 percent on the baseline assessment to 46 percent on the follow-up assessment.
- Two of the three sites (Site A and Site B) were reporting fewer student behavior problems and disciplinary incidents.
- Site A was designated one of six exemplary middle schools in New England by the New England League of Middle Schools in 1994-1995.

Parental Involvement and Support

At all three sites, there had been a marked increase in parent involvement and support for the schools' programs.

- At Site A, about 95 percent of parents were regularly attending parent-teacher conferences. About twenty parents were taking part in decision-making and policy review processes at the school. A parent was co-chairing the school governance council with the principal, and parents were outspoken advocates for Co-NECT at school committee hearings. Parents, after being trained in basic classroom management techniques, were also beginning to help out in the classroom, thus freeing teachers for planning and professional development activities.
- Site C also noticed a dramatic increase in parent support. Approximately 150 parents attended a PTSA forum held in February and voiced overwhelming endorsement for the Co-NECT Project.
- At Site B, parents are becoming actively involved in student project work, providing resources and lending support.

In parents' words,

> "My daughter feels that she is part of a family and for Hispanic parents and culture, this is an extremely important point."
>
> I believe this program is getting my son ready for the real workplace in the real world."
>
> Maybe adults can afford to wait for schools to improve, but children can't. I feel Co-NECT is giving my kids a chance for a better education now."

Community Support

The Co-NECT design calls for multiple, "two-way" relationships between the school and the community. In all of our schools, these kinds of relationships are already beginning to form.

- In conjunction with the project-centered curriculum, Site A has new relationships with a local science museum, medical center, the local police department, and several other institutions and businesses. As a result, an increasing number of citizens advocate for the school to the school committee and city officials.

- Site B has also witnessed a significant increase in community agency involvement in conjunction with student projects. Agencies that have been involved with the school include the Forest Service, Alaska Discovery, Princess Tours, Public Health, the Fish and Game Service, and various local artists and writers.

4. SUMMARY OF PROGRESS, CHALLENGES AND RECOMMENDATIONS FOR FUTURE WORK

Unsurprisingly, our results after the first two years of implementation have been encouraging yet mixed. At the end of 1994-1995, all three of our sites were demonstrating significant changes in the way that teaching and learning was being organized, in the use of technology, in community relations, and in the way goals were being set and progress measured. Early achievements, measured in terms of student rest scores, student engagement, parent satisfaction, and levels of community involvement, were encouraging.

At the same time, we have become acutely aware that we are dealing with complex, multilevel organizations, characterized by a large number of cultures and subcultures that exhibit varying degrees of compatibility. Although the culture of a given classroom is probably determined largely by the beliefs and accustomed practices of the teacher in charge, the tendency for the classrooms in a given school to display one kind of culture or another is influenced by the school culture, which is more or less open to influence by the dominant actors at that level--by the principals, assistant principals, and lead teachers. The behavior of these actors is in turn more or less influenced by key actors at the district level (notably, the superintendent) and also by members of the local community (business leaders, parents, members of the press).

From the point of view of results--what students actually learn--it's what goes on in individual classrooms that really matters. Ideally, the whole, multilevel organization works in concert and collaboration to ensure that students are learning what the community wants them to be learning.

In practice we find this is seldom the case. Different cultures and subcultures are often at odds, leading to friction, frustration, and missed opportunities. For example, as previously noted, Site C has split into two opposing groups of teachers, one "traditional" and one "progressive;" vocal parents have aligned themselves with the progressive teachers; and although the principal is trying to institute schoolwide reforms, he does not appear to have strong support from the district. Both Site A and Site C have been plagued by a discrepancy between traditional, district-mandated testing programs and the kinds of innovations in teaching and learning the Co-NECT design promotes. When teachers and administrators are held accountable only for results on traditional multiple-choice tests, there is a strong incentive to focus narrowly on the kinds of outcomes that such tests measure.

Finally, at all three sites, one continues to find considerable variation in the quality of teaching and learning from one classroom to another. While some teachers are beginning to demonstrate "progressive" practices and beliefs--e.g., stressing the importance of higher-order thinking skills, frequently organizing students in groups, and promoting explanation and discussion as opposed to simple correct answers, others are still narrowly focused on "basic skills," organizing desks in rows facing the front, and doing most of the talking.

Projections call for the Co-NECT school network to expand to some 50 schools around the country within the next year, and to more than 200 schools by the turn of the century. As we scale up our activities to support this expanding community, two things seem certain. First, technology will continue to evolve and extend opportunities for collaborative work and learning, often in unexpected directions. Second, while the pace of educational reform may quicken, the frustrating gap between what is theoretically possible and what works in practice will continue to challenge even the best efforts at technology-supported educational restructuring. We look forward to working with our school partners, current and future, to narrow the gap between our collective vision of a new generation of American schools, and the daily realities of our existing ones.

5. PORTFOLIO APPENDICES[5]

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[5] The following appendix materials serve to illustrate the types of documentation that might be included in a progress assessment portfolio. Because some Co-NECT results were preliminary at this writing, data descriptions corresponding to results reported in Section 3 of the portfolio were unavailable. A complete version of the reform portfolio would include test report from design-based and jurisdiction-sponsored assessments (with information about score scales and standards); data reports from teacher, student, and parent surveys; Critical Friends reports; lists of community partners; and so on.

Appendix I: Sample Critical Friends Report

The following report was submitted by a Co-NECT Critical Friends team on completion of a three-day visit with colleagues at one of our schools. The visit began with a workshop on Sunday afternoon, followed by a reception that evening hosted by teachers, parents, staff, and union representatives at the school. The critical friends team then visited the school, "shadowing" students, observing classes, and interviewing parents over a two-day period. On Tuesday afternoon the group met and prepared the following report, which represents the consensus view of all visiting nine teachers and the two facilitators.

The school is currently prioritizing the "challenges" identified below and will draw up an action plan to address them. The entire Co-NECT community stands behind the school's efforts to significantly improve the quality of teaching and learning at the school in ways suggested by this report.

Grouping

How is multi-age grouping working? Are students' needs being met?

Strengths	***Challenges***
Students report positive experiences with multi-age grouping, including opportunities to make new friends, and to take responsibility for helping other students.	
Many teachers seem to have adapted well to the mixed-age groups in projects and "specials" classes.	Teachers need to find ways to assess and meet the needs of different ability levels in all subject areas.
Students report that multi-age grouping creates a positive sense of family, and it is evident that this is really happening. (Though teachers and students should continue to discuss how multi-age grouping is working.)	Students need training in specific group skills so as to be productive and effective members of a team. Teachers need to monitor the structure and effectiveness of the group, and respond accordingly.

Technology

In what ways are computer tools (such as spreadsheets and database programs) being used to support project work?

Strengths	*Challenges*
Thanks to strong district support, the school is well-equipped with computer hardware.	The school needs to expand its software library (including CD ROM) to support students and to help teachers with classroom management.
Students are eager to learn more about the technology and what they can do with it. There is strong parental support for increased use of technology.	Students need to learn productive uses of existing software, beyond simple word processing and playing of games.
Students are beginning to help each other learn computer skills.	The school needs to further develop and implement strategies for disseminating computer expertise among both teachers and students, and to encourage respect for and ethical use of technology by students.
Computers are starting to be integrated into project work, especially for word processing.	Use of calculators should be promoted throughout the curriculum, as specified by the NCTM standards. Other technologies, including video and telephone, should be made widely available for use by students and teachers.
	Desktop Internet access must be established immediately, allowing the school to become fully incorporated into the larger Co-NECT community.

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Projects

How are students dealing with the independence and autonomy afforded by project work?

Strengths	***Challenges***
Most students enjoy the opportunity to take part in projects and are enthusiastic about them.	Students and teachers need to clarify essential questions in order to focus project work.
Teachers are learning to prepare students to be more autonomous through checklists and organization skills, such as goal-setting and planning.	Students need to master ethical and efficient research techniques. Independent student work needs to be carefully monitored by teachers to improve the quality of research skills and processes.
The scheduling framework is in place to support project work.	Project work needs to extend, refine, and apply interdisciplinary knowledge, invite curiosity, and generate inquiry.
Teachers have begun to design and implement projects that extend the learning environment into lives and institutions outside the school walls.	Project work needs to extend beyond the school day, with homework as an integral part of the process.
Teachers have invited help in developing projects that go beyond simple processing of information.	Teachers and students need to build project organization skills, so that all students may contribute actively and productively.
Students are engaged in the projects, generating some of their own questions, and are beginning to develop a sense of purpose.	Students need to develop ownership of their projects, and see how projects are connected to their own lives and futures.
	The school needs to develop clearly defined standards, rubrics, and models of successful project work.

Traditional Coursework

What appears to be the purpose and focus of "seminars?"

Strengths	***Challenges***
Teachers recognize the need to help students develop basic skills that will support them in their project work.	Teachers need to create contexts in which students can acquire basic skills and critical skills (as defined in the Co-NECT design guide) in ways that are as interesting, engaging, and challenging as in their project work.
The school has responded to community requests for students to pursue advanced work.	
Teachers are beginning to connect basic skills and project work.	Students need to be encouraged to ask challenging questions and monitor their own understanding.
	The school needs to develop a standards-based assessment system that will shift focus away from tests and grades.
	Teachers need to facilitate and organize classes to maximize time on task and active engagement.

School Community

What kinds of relationships seem to be developing among teachers and students? Among teachers?

Strengths	*Challenges*
Parents demonstrate an understanding of the Co-NECT model and urgently support the program, including its extension into the high school.	Parents need to be given opportunities to participate more actively in the school community and the change process.
Relationships between students and teachers are warm and informal, especially outside of the classroom and during project work.	
Students seem to enjoy and benefit from their "advisory groups." Many teachers advocate for individual students, (e.g., when they have scheduling problems), and recognize individual student effort.	The school needs to design a system of advisories that gives every student regular contact with a personal advocate over an extended period of time.
Specialists are beginning to collaborate with teachers on projects.	
Most students have a genuine respect for teachers and staff.	
Teachers' relationships with each other form a strong foundation of support and encouragement for continuing professional growth.	

The
Co-NECT
School

Report on the Spring 1995 Follow-Up Assessments

June 1995

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Explanation of Tables

The title for each table identifies the test and subject reported in the table. An explanation of columns within the table is as follows:

Item
Refers to the code number of the item.

Format
Indicates whether the item was performance, open-ended short answer, open-ended long answer, or multiple-choice.

Description
Presents a brief summary of the item contents.

School Average
Represents the percent of students from the Lincoln School who answered the item correctly.

Urban Average
Represents the percent of grade 8 students from other urban schools who answered the item correctly (student samples from Lincoln School contained students who in other schools would be in grades 6, 7, and 8).

Comparison Difference
Represents a rough summary of differences between the performance of students at the Lincoln School and other urban schools. If this difference was greater than or equal to 10 percent a "+" or "-", to indicate the direction of the difference, was included in this column.

Brief Description of NAEP Items Administered to the Advanced Cluster - Spring '95

Reading

Item	Format	Description	Content	Process	Fall '93 Average	Spring '94 Average	Spring '95 Average	National Average	Fall Difference	Spring Difference
1	Multiple Choice	Interpret geographical map	Documents	Locate Information	73%	87%	98%	94%	♦	♦
2	Multiple Choice	Compare two geographical locations	Documents	Compare	62%	80%	86%	93%	♦	
3	Multiple Choice	Compare alternate routes between two points	Documents	Compare	58%	70%	57%	88%		
4	Multiple Choice	Interpret meaning of a short story	Inform. Text	Extend Meaning	69%	87%	77%	81%		
5	Multiple Choice	Reasoning from text	Inform. Text	Extend Meaning	59%	52%	50%	72%		
6	Multiple Choice	Applying additional information to text	Inform. Text	Extend Meaning	69%	77%	70%	81%		
7	Multiple Choice	Read and recall a short story	Inform. Text	Construct Meaning	53%	67%	75%	73%	♦	
8	Short Answer	Write an answer to a recall question	Inform. Text	Construct Meaning	0%	33%	34%	63%	♦	
9	Multiple Choice	Interpret meaning of a short story	Literary Text	Extend Meaning	45%	59%	61%	80%	♦	
10	Multiple Choice	Read and recall a short story	Literary Text	Construct Meaning	46%	66%	61%	84%	♦	
11	Multiple Choice	Read and recall a short story	Literary Text	Construct Meaning	39%	61%	57%	96%	♦	
12	Multiple Choice	Read and recall a short story	Literary Text	Construct Meaning	54%	74%	64%	94%	♦	
13	Multiple Choice	Interpret meaning of a short story	Literary Text	Extend Meaning	42%	69%	59%	79%	♦	
14	Multiple Choice	Interpret meaning of a short story	Literary Text	Extend Meaning	45%	62%	50%	81%		
15	Short Answer	Write answer requiring interpretation of a short story	Literary Text	Extend Meaning	0%	28%	30%	66%	♦	
Median					54%	67%	61%	81%		

Advanced Level Follow-Up Report, 695, p. 14.

Brief Description of NAEP Items Administered to the Advanced Cluster - Spring '95

Math

Item	Format	Description	Content	Process	Fall '93 Average	Spring '94 Average	Spring '95 Average	National Average	Fall Difference	Spring Difference
39	Multiple Choice	Converting units of measurement (min-hrs)	Measurement	Procedural	31%	54%	48%	59%	+	
40	Multiple Choice	Algebra	Num. & Operat.	Procedural	14%	30%	27%	49%	+	
41	Multiple Choice	Spatial reasoning	Geometry	Conceptual	55%	75%	66%	62%	+	
42	Multiple Choice	Reading a scale	Measurement	Procedural	77%	90%	73%	92%		-
43	Multiple Choice	Averaging, aggregation	Anal, Stats & Prob.	Conceptual	17%	43%	30%	48%	+	-
44	Multiple Choice	Modeling (associative prop. of multiplication)	Num. & Operat.	Conceptual	20%	33%	34%	43%	+	
45	Multiple Choice	Algebra	Algebra & Funct.	Procedural	17%	44%	32%	46%	+	-
46	Multiple Choice	Probability	Anal, Stats & Prob.	Problem Solving	30%	52%	52%	58%	+	
47	Multiple Choice	Units of measurement (attributes)	Measurement	Conceptual	21%	46%	45%	44%	+	
48	Multiple Choice	Geometry	Geometry	Conceptual	37%	48%	36%	60%		-
49	Multiple Choice	Measurment, linear	Geometry	Problem Solving	14%	31%	27%	30%	+	
50	Multiple Choice	Pattern recognition	Num. & Operat.	Procedural	13%	13%	16%	18%		
51	Multiple Choice	Geometry	Geometry	Problem Solving	13%	18%	25%	25%	+	
52	Multiple Choice	Geometry	Geometry	Conceptual	20%	11%	7%	22%	-	
53	Multiple Choice	Algebra and measurement	Algebra & Funct.	Conceptual	3%	10%	7%	15%		
54	Multiple Choice	Pattern recognition	Algebra & Funct.	Problem Solving	14%	20%	32%	34%	+	+
55	Short Answer	Math reasoning and communication	Algebra & Funct.	Conceptual	7%	48%	20%	15%	+	-
56	Multiple Choice	Probability	Anal, Stats & Prob.	Procedural	17%	21%	41%	39%	+	+
Median					17%	38%	32%	43%	+	

Advanced Level Follow-Up Report, 6/95, p. 15.

Brief Description of NAEP Items Administered to the Advanced Cluster - Spring '95

Science

Item	Format	Description	Content	Process	Fall '93 Average	Spring '94 Average	Spring '95 Average	National Average	Fall Difference	Spring Difference
16	Multiple Choice	Identify what constitutes a scientific observation	Nature of Science	Knowing Science	44%	61%	61%	55%	+	
17	Multiple Choice	Designing an experiment	Nature of Science	Knowing Science	46%	51%	36%	58%	-	-
18	Multiple Choice	Solving simple physics problem	Physical Science	Solving Problems	56%	64%	70%	65%	+	
19	Multiple Choice	Control of dependent variable	Life Science	Conduct Inquiry	80%	84%	64%	72%	-	-
20	Multiple Choice	Control of independent variable	Life Science	Conduct Inquiry	35%	51%	39%	50%		-
21	Multiple Choice	Importance of replication for reliable results	Life Science	Conduct Inquiry	17%	11%	20%	27%		
22	Multiple Choice	Identify what constitutes a hypothesis	Nature of Science	Knowing Science	38%	61%	55%	50%	+	
23	Multiple Choice	Design of an experiment	Earth/Space Sci.	Conduct Inquiry	58%	56%	61%	56%		
24	Multiple Choice	Knowledge of geology of earth's interior	Earth/Space Sci.	Knowing Science	28%	36%	32%	38%		
25	Multiple Choice	Why did dinosaur become extinct	Life Science	Solving Problems	44%	49%	52%	49%		
26	Multiple Choice	Table interpretation and simple arithmetic	Earth/Space Sci.	Solving Problems	25%	31%	36%	38%	+	
27	Multiple Choice	Table interpretation	Earth/Space Sci.	Solving Problems	38%	38%	27%	39%	-	-
28	Multiple Choice	Experimental design	Nature of Science	Conduct Inquiry	31%	15%	32%	29%		+
29	Multiple Choice	Knowledge concerning names of wind directions	Earth/Space Sci.	Knowing Science	21%	21%	25%	33%		
30	Multiple Choice	Knowledge concerning names of geological processes	Earth/Space Sci.	Solving Problems	27%	44%	39%	44%	+	
31	Multiple Choice	Design of experiment	Life Science	Conduct Inquiry	23%	44%	48%	42%	+	
32	Multiple Choice	Design of an experiment and knowledge of measuring volume	Physical Science	Conduct Inquiry	34%	33%	34%	39%		
33	Multiple Choice	Knowledge of geological formations in southwest US	Earth/Space Sci.	Solving Problems	24%	33%	25%	27%		
34	Multiple Choice	Design of an experiment	Physical Science	Conduct Inquiry	17%	21%	32%	21%	+	+
35	Multiple Choice	Graph interpretation and theorizing	Earth/Space Sci.	Solving Problems	20%	28%	23%	27%		
36	Short Answer	Interpret tabulated data	Physical Science	Conduct Inquiry	51%	16%	48%	67%		+
37	Short Answer	Explain how to interpret a table	Physical Science	Conduct Inquiry	42%	34%	18%	61%	-	-
38	Short Answer	Knowledge of how energy is produced in a battery	Physical Science	Conduct Inquiry	0%	34%	5%	5%		-
Median					34%	36%	36%	42%		

Brief Description of UDAC O-E Items Administered to the Advanced Cluster - Spring '95

Reading

Item	Format	Description	Content	Process	Fall '93 Average	Spring '94 Average	Spring '95 Average	Urban Average	Fall Difference	Spring Difference
R20-C08	Short Answer	Interpretation of poet's (literal) values	Literary Text	Extends Meaning	48%	40%	62%	NA	+	+
R30-C09	Short Answer	Explain basis for (a given) interpretation of poem	Literary Text	Constructs Meaning	56%	36%	72%	NA	+	+
R20-C16	Long Answer	Locates details in text	Literary Text	Locate Information	37%	81%	18%	53%	-	-
R25-C17	Long Answer	Decodes definition of term 'agricultural worker'	Literary Text	Constructs Meaning	29%	46%	77%	29%	+	+
R25-C18	Long Answer	Provides evidence to support a conclusion from text	Literary Text	Extends Meaning	29%	41%	50%	NA	+	
R25-C19	Long Answer	Interpretation - why was it important for person to help mother	Literary Text	Constructs Meaning	41%	40%	45%	NA		
R30-C20	Long Answer	Decodes concept 'consciousness to be born'	Literary Text	Constructs Meaning	29%	38%	70%	24%	+	+
R30-C21	Long Answer	Evaluates evidence to support conclusion from text	Literary Text	Evaluate Information	27%	44%	50%	41%	+	
R25-C22	Long Answer	Compare and contrast character's experience with one's own	Literary Text	Compare information	58%	44%	57%	41%		+
R35-C23	Long Answer	Describe a conscious-raising event in your life	Literary Text	Constructs Meaning	21%	16%	36%	24%	+	+
lian					33%	41%	53%	35%	+	+

Writing

Item	Format	Description	Content	Process	Fall '93 Average	Spring '94 Average	Spring '95 Average	Urban Average	Fall Difference	Spring Difference
WCr-C01	Short Answer	Creative, procedural writing	NA	NA	83%	83%	85%	68%		
WCr-C02	Short Answer	Procedural and descriptive writing	NA	NA	69%	51%	63%	57%		+
WCr-C34	Long Answer	Creative writing	NA	NA	71%	41%	54%	NA	-	+
WNa-C35	Long Answer	Descriptive writing	NA	NA	56%	43%	44%	NA	-	
lian					70%	47%	59%	63%	-	+

c.In Sci.: Advanced Level Follow-Up Report, 695, p. 17.

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Brief Description of UDAC O-E Items Administered to the Advanced Cluster - Spring '95

Math

Item	Format	Description	Content	Process	Fall '93 Average	Spring '94 Average	Spring '95 Average	Urban Average	Fall Difference	Spring Difference
M25-C03	Short Answer	If A ≠ B & B ≠ C & C ≠ D, then could A = D? Explain	Algebra & Funct.	Problem Solving	5%	22%	23%	9%	+	
M25-C04	Short Answer	If D = 2, then what does A equal?	Algebra & Funct.	Proc. Knowledge	4%	6%	8%	9%		
M25-C05	Mult. Choice	Group weights A with 2 and B with 1. Select correct beam	Measurement	Concept. Undstng.	48%	41%	45%	43%		
M25-C06	Short Answer	What could X and Y weigh in order to balance the beam?	Algebra & Funct.	Proc. Knowledge	57%	41%	68%	39%	+	+
M30-C07	Long Answer	Is there more than one solution to the problem? Explain	Algebra & Funct.	Problem Solving	23%	27%	35%	12%	+	
M30-C24	Long Answer	Compute the average speed of the two groups	Anal, Stats & Prob.	Proc. Knowledge	45%	5%	16%	26%	-	+
M30-C25	Long Answer	Is there a relationship between average speed of animals & diet?	Anal, Stats & Prob.	Problem Solving	15%	43%	30%	5%	+	-
M30-C26	Long Answer	Which category would fox fall under (>30, <30)? Explain	Anal, Stats & Prob.	Problem Solving	16%	29%	23%	21%		
M30-C27	Long Answer	How many different lunch combinations are possible?	Anal, Stats & Prob.	Proc. Knowledge	33%	44%	32%	32%		-
M30-C28	Long Answer	What is probability of having turkey club with milkshake?	Anal, Stats & Prob.	Proc. Knowledge	31%	30%	48%	16%	+	+
dian					27%	29%	31%	19%		

Science

Item	Format	Description	Content	Process	Fall '93 Average	Spring '94 Average	Spring '95 Average	Urban Average	Fall Difference	Spring Difference
S25-C10	Short Answer	When you plug in a radio into same circuit, why does light dim?	Physical Sciences	Knowing Science	57%	NA	NA	50%		
S25-C11	Long Answer	If all switches closed and you open switch C, what will happen?	Physical Sciences	Knowing Science	2%	11%	12%	3%		
S25-C11	Long Answer	Draw a circuit with a battery, at least 2 bulbs and a switch.	Physical Sciences	Knowing Science	NA	40%	71%	NA		+
S25-C12	Long Answer	If all switches closed and you touch wire at E, will shock occur?	Physical Sciences	Knowing Science	53%	NA	NA	42%		
S25-C12	Long Answer	What happens to brightness of bulbs when an extra bulb is added?	Physical Sciences	Knowing Science	NA	48%	58%	NA		
S25-C13	Long Answer	If you are shocked at E, will it be greater or less than at A?	Physical Sciences	Conduct Inquiry	7%	NA	NA	5%		
S30-C13	Long Answer	Change circuit to get different results when extra bulb is added.	Physical Sciences	Knowing Science	NA	10%	30%	NA		+
S25-C14	Short Answer	If you are an astronaut on moon, will you hear crash?	Earth/Space Sci.	Conduct Inquiry	78%	78%	70%	NA		
S30-C15	Short Answer	Describe why a sound would or would not be heard?	Earth/Space Sci.	Conduct Inquiry	22%	33%	52%	8%	+	+
S30-C29	Short Answer	What will happen to cliff and house if rains continue?	Earth/Space Sci.	Conduct Inquiry	68%	NA	NA	NA		
S30-C30	Short Answer	What could be done to prevent owners from losing their house?	Earth/Space Sci.	Solving Problems	34%	NA	NA	NA		
S30-C31	Long Answer	What question was he trying to answer with this experiment?	Nature of Science	Conduct Inquiry	51%	43%	65%	35%	+	+
S30-C32	Long Answer	Why do you think Eugene made four measurements?	Nature of Science	Conduct Inquiry	41%	25%	60%	26%	+	+
S30-C33	Long Answer	What was best conclusion that Eugene could make from data?	Nature of Science	Conduct Inquiry	37%	36%	63%	38%	+	+
dian					41%	36%	55%	31%	+	+

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Brief Description of UDAC Performance Items
Administered to the Advanced Cluster - Spring '95

Reading

Item	Format	Description	Fall '93 Average	Spring '94 Average	Spring '95 Average	Urban Average	Fall Difference	Spring Difference
EMR20-P02	Short Answer	Describe problem depicted by a picture.	50%	67%	90%	48%	+	+
EMR25-P03	Short Answer	Select pictures related to a speech.	56%	24%	83%	37%	+	+
EMR30-P01	Record Answer	Retell a speech.	80%	89%	81%	74%		
EMR35-P04	Long Answer	Create a graduatation speech.	70%	62%	81%	59%	+	+
Median			63%	65%	82%	54%	+	+

Writing

Item	Format	Description	Fall '93 Average	Spring '94 Average	Spring '95 Average	Urban Average	Fall Difference	Spring Difference
EPWIN-P01	Long Answer	Describe element of a mural and why it was selected.	62%	47%	40%	33%	-	

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Brief Description of UDAC Performance Items
Administered to the Advanced Cluster - Spring '95

Math

Item	Format	Description	Fall '93 Average	Spring '94 Average	Spring '95 Average	Urban Average	Fall Difference	Spring Difference
EMM20-P01	Short Answer	Record number of cubes required to build 3x3x3 cube.	82%	NA	NA	100%		
EMM20-P01	Short Answer	Smallest number of toothpicks to make 2 squares.	NA	87%	82%	NA		
EMM25-P02 *	Short Answer	Predict and then record cubes with faces.	20%	NA	NA	44%		
EMM25-P02	Short Answer	Smallest number of toothpicks to make 3 squares.	NA	87%	87%	NA		
EMM25-P03	Short Answer	Smallest number of toothpicks to make exactly 4 squares.	NA	16%	20%	NA		
EMM30-P03	Short Answer	Calculate how many cubes will have faces for different sized cubes.	43%	NA	NA	30%		
EMM30-P04	Short Answer	Draw 2 ways to make 5 squares with no more than 16 toothpicks.	NA	49%	80%	NA		+
EMM35-P04	Short Answer	Evaluate predications.	31%	NA	NA	67%		
EMM30-P05	Short Answer	Create rectangle with perimeter less than 24. Record actual size.	43%	82%	100%	56%	+	+
EMM35-P06	Short Answer	Create rectangle with perimete half the size of rectangle A.	31%	49%	36%	37%		
EMM35-P07	Short Answer	Create rectangle with area twice the size as A.	16%	5%	29%	37%	+	+
EMM35-P08	Short Answer	Create triangle with area 1/2 that of rectangle A.	8%	3%	9%	0%		
EMM25-P09	Short Answer	Explain reasons for taking more money than needed to the store.	65%	85%	100%	NA	+	+
Median			31%	49%	80%	41%	+	+

Science

Item	Format	Description	Fall '93 Average	Spring '94 Average	Spring '95 Average	Urban Average	Fall Difference	Spring Difference
EMS20-P01	Short Answer	List ways in which different sets of leaves are similar.	75%	66%	88%	69%	+	+
EMS20-P02	Short Answer	List ways in which some sets are alike but others are different.	59%	85%	72%	80%	+	
EMS25-P03	Short Answer	Complete chart that defines characteristics of leaves.	51%	73%	100%	NA	+	+
EMS30-P04	Short Answer	Evaluate ways of sorting the sets of leaves.	41%	20%	80%	NA	+	+
EMS30-P05	Short Answer	Develop an experiment to test temp/dissolving relationship.	46%	66%	50%	11%		
EMS30-P06	Short Answer	Create a table in which data for the experiment can be recorded.	51%	36%	76%	43%	+	+
EMS30-P07	Short Answer	Conduct the experiment and record the data.	59%	25%	58%	43%		+
EMS30-P08	Short Answer	Describe what occured during the experiment.	58%	39%	72%	60%	+	+
EMS30-P09	Short Answer	Express the results as a ratio.	39%	15%	60%	11%	+	+
EMS30-P10	Short Answer	Explain what may have effected the results.	24%	32%	16%	6%		
EMS30-P11	Short Answer	Describe ways in which the experiment can be improved.	37%	27%	28%	6%		
EMS30-P12	Short Answer	How would a different form of the substance affect the results.	35%	39%	20%	6%		
EMS30-P13	Short Answer	How would different amounts of water affect the results.	34%	17%	48%	9%	+	+
EMS30-P14	Short Answer	Explain how different sized tablets might affect the results.	45%	44%	32%	31%		
EMS30-P15	Short Answer	Explain how a different substance might affect the results.	15%	19%	12%	31%		
EMS30-P16	Short Answer	Describe what was learned about sound during an experiment.	51%	47%	84%	34%	+	+
EMS30-P17	Short Answer	List other things about sound student would like to know.	38%	46%	56%	NA	+	+
EMS25-P18	Short Answer	Describe how a sound can be made louder without striking harder.	8%	19%	0%	0%		
Median			43%	37%	57%	31%	+	+

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Advanced Level Follow-Up Report, 6/95, p. 20.